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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE USUAL COURSE OF PROCEDURE OF AGRICULTURAL SOCIETIES.

To the Editor of the Farmers' Register.

Dec. 1, 1834.

The rapid increase of our agricultural societies, since the establishment of the "Farmers' Register," to which I confidently ascribe it, has been a source of much gratification to one who has been, so long as I have, a firm believer in their great utility. But many things are wanting in their usual management to render them as beneficial as they might be, to the general interests of husbandry. The cause of this deficiency it is needless to investigate; but it is highly important, if I am right as to the fact, that the errors should be pointed out, and some remedy suggested. This I propose to do, if an old campaigner in such matters may hope to be acquitted by his agricultural brethren, of presumption in taking upon himself this monitorial office.

In the first place, there is too little punctuality on the part of their members, in attending their periodical meetings. There are two great disadvantages in this—one is, the total loss of their personal co-operation; the other—the usual non-payment by such absentees, of their annual subscriptions, which is almost sure to produce displeasure, if not withdrawal, when these arrearages are demanded; especially if they have been suffered to accumulate for two, or three, or four years.

In the next place there is far too great a backwardness on the part of those who do attend these meetings, in communicating individually, either verbally, or in writing, the results of each member's own agricultural experience for the past year, or six months, according as their meetings may be annual or semi-annual. A false modesty, or still less excusable indolence, is the cause of this, and the consequence to the society is, that each attending member returns home very little wiser than he was in regard to the chief objects for which such societies are established. The most important of these surely is, to enable each member to add something to his own professional knowledge, by free and frank communications interchangeably made by all. Until this can be regularly and constantly done at the regular meetings of every society, they will prove but little more than mere convivial assemblages of friends and acquaintances, who like to see each other face to face, and to shake hands at least once or twice a year.

The remedy which I would respectfully suggest for the first evil is, the punctual attendance of the members at all the meetings of their respective societies—an attendance which nothing should be suffered to prevent, but some urgent necessity—and the no less punctual payment of every annual subscription.

To prevent the second evil, I would most earnestly recommend that every attending member should hold himself bound to make some statement, either verbal or written, no matter how concise, provided it be sufficiently particular, of the management and condition of his own farm, (if he has one,) for the preceding six or twelve months. These, when written, might be in a tabular form, such as I myself know, (for I have seen them) were constantly made by Gen. Washington's manager, at Mount Vernon, and which were as minute and particular, as any that he ever required from the heads of the different departments in his army. Reports made on similar principles, and with equal care, to our agricultural societies, by their respective members, would form a body of agricultural statistics, highly valuable to each, at the same time that they would diffuse more rapidly than by any other means, over the entire country within the limits of every society, the whole stock of knowledge possessed by its members, in all the different branches of husbandry. Then, indeed, but not until then, would these societies soon prove how much good they are capable of effecting, and how rapidly by their agency, the now melancholy aspect of most of our arable lands might be changed to an appearance of exuberance and joyous plenty. One of the happiest effects of this conviction, would be to check, at least, if not entirely to banish from good old Virginia, that desolating spirit of emigration which has long been, and still is tearing asunder among us, the ties—not only of neighborhood, long acquaintance, and friendship, but of blood—of family union—of fathers—mothers, and children—of brothers and sisters—and in some instances, even of husbands and wives. When once these bonds of natural affinity are ruptured, a cold-blooded selfishness—an insatiate money-getting spirit—is apt to get possession of us, to the exclusion of almost all our better feelings and affections. We soon lose all attachment to the homes of our fathers—we never again feel *settled;* and are ready at a few hours notice, to flee with the speed of wandering Arabs, to the extremities of the earth, in search of other new lands, provided only, we have persuaded ourselves, that they will yield us more money! more money!

Another evil which greatly lessens the utility of our agricultural societies, at least where their funds enable them to have shows and fairs, is the principles upon which they award their premiums. Although these principles have again and again been demonstrated to be both false and highly pernicious, especially by that excellent farmer Timothy Pickering, so long president of the most celebrated of all the northern and eastern agricultural societies, yet they still continue to regulate the distribution of premiums in every society with which I am acquainted. Let it suffice to exemplify my accusation by stating the cases of fattened animals, whether exhibited on the hoof, or slaughtered. Here the premium is invariably awarded to the one which is judged to be *the fattest*, without the slightest inquiry whatever, as to the expense of feeding—even where a statement upon honor of the process is required in their handbills. The consequence always is, that the competitor who is most profuse in feeding—who is most anxious to obtain the premium without re-

gard to the cost of his prize, will gain it from his rivals. But the object of all these premiums should really be, to ascertain and establish the most economical way of fattening stock of every kind; and consequently, a particular and trustworthy statement of the mode of fattening, should never be dispensed with in any case whatever. By no other means can the poor farmers be enabled to compete with the rich, although to encourage this competition, without a risk of loss to either, ought surely to be one cardinal purpose of every agricultural society; and this can be done only by making economy, and not profusion in the process of fattening, the chief test of superiority.

In reviewing the previous remarks, I find that I have omitted what seems to me the strongest argument in favor of annually requiring, as a matter of duty, verbal or written statements from all the members of our agricultural societies, who are cultivators of the soil. The consciousness of this obligation would be a powerful incentive to increased effort in all their agricultural operations, while its fulfilment would teach them *method*—a thing in which most southern agriculturists are deplorably deficient; for not a few may be found who keep no farming accounts whatever—who have no knowledge of what their net profits, (if any,) may be; nor can tell any thing scarcely, about their farms, but the gross amount of sales. The apprehension too, of each reporting member, lest his own statement might fall below the average standard, would certainly excite a more constant and judicious attention to every part of his professional business, than if no such public expose was required to prove how far he had fulfilled all the duties of a good farmer. It is true that such a requirement would tend strongly to produce exaggerated reports, but men *must trust* each other to some extent, in almost all situations; and in this case we ought to hope, that the sentiments of truth and honor would so far check "the long-gun shooters" to be found in all large associations of men, as to secure unvarnished statements from a great majority of the members of every agricultural society, who could be prevailed upon to report at all. The performance of this duty would not, of course, be expected from any but the cultivators of the soil. These, however, should feel themselves bound to perform it, and then each would become more and more attached to his partieular society, from a consciousness that he was every year contributing something more than his mere subscription money, towards the benificent objects of its establishment. All members need not be farmers, planters, or graziers; but all should be, at least, thoroughly convinced of the great utility of agricultural societies, and constantly desirous to co-operate actively in promoting their purposes. Then would the salutary efficiency of these associations soon be rendered so perfectly manifest to all, that there would scarcely be a county in the state without them. There is but *one* class of persons among those who are apt to become members, that I think ought to be carefully excluded, if there was any mark by which they could be previously known. I mean the dragoons of that flying squadron of pretended agriculturists, who dash *in*, wherever they expect some paltry pecuniary gain, by carrying off premiums, and then, as suddenly, dash *out*, when the prospect of such petty plunder no longer presents itself. These harpies care no more for the interests of agriculture than they do for those of the Grand Turk, and generally know quite as little about them. But they will always be found hovering over, and ready to pounce upon the funds, however slender, of every agricultural society, where there are shows and fairs. Their motives, however, usually carry their own punishment along with them; for like gamblers in a lottery or at faro, they almost always leave more money than they carry away. Although each is ready to say, "farewell, ye agricultural gulls," as soon as he clutches the miserable pittance for which he came, this is generally more than reimbursed by the greedy contributions of his unsuccessful competitors of the same squadron or troop. Verily they get their deserts in the loss of some two or three dollars, and the gain of angry and grievous disappointment in failing to make some six, seven, or eight hundred per cent. upon their petty out-lay of some two or three hundred cents! Add to this, they are always sure of a rich recompense of reward in the scorn and contempt of all who understand their motives.

J. M. G.

P. S. To make myself better understood in regard to the annual reports recommended to be made by all the members of our agricultural societies, who are cultivators of the soil, I will take the liberty of suggesting the following heads for each, in a form sufficiently abbreviated, yet minute, to answer the purpose.

Let each report state the number and kind of laborers on the farm—the number of fields, of cultivated acres in each, and rotation of crops: the number of plough team, and whether horses, mules, or oxen: how fed and sheltered, and whether kept up constantly, or occasionally grazed: average number of acres to the plough: average produce per acre in bushels of corn, wheat, oats, rye, and root crops: pounds of cotton and tobacco per acre: preparatory ploughing for corn and other crops, how and when performed: corn, with what implements, and how cultivated and harvested: what use is made of the offal: small grain, how seeded and harvested: number of different kinds of stock, other than plough team, with their annual increase or decrease—how fed and sheltered: how much land manured by each kind, or all together, and from other sources, if any: time and distance of hauling out manure: what increase of product by its application, and how applied—by ploughing in, or surface dressing: fallowing, if any, how and when executed: what artificial grasses are cultivated, and how fed away: how many of each kind of stock are fattened for market, or family use, and what has been the process of fattening.

The minute particularity of the foregoing statement, I dare say, will cause many to exclaim, "oh! too troublesome entirely: I can't go it;" while some of "the goodenoughs," in all the ineffable pride of their self-sufficiency, will even make a jest of it. But since it must be perfectly obvious, on the slightest reflection, that all these circumstances are regarded as matters of importance, on every well regulated farm, they are certainly worthy the attention of all agriculturists desirous of improving in their profession. To such as care little or nothing about it, or believe themselves

omniscient in husbandry, the remarks are not addressed at all. But we will venture to affirm, of all others who could prevail upon themselves to attend to them so far as to undertake the making of some such report once a year, that they would not only greatly increase their own knowledge thereby, but would render their farms and every thing on them, both more profitable and interesting. Their fondness for their profession and customary employments, would augment in proportion to the additional advantages and enjoyments which such attention to it would procure; and they would soon make *a pleasure of their business*, instead of *a business of their pleasure*, as too many of our land-owners in Virginia have been doing from the earliest settlement of our state. This dereliction of agricultural duties—which seems to have been hereditary in numerous families—co-operating with an indiscriminate, most wasteful, and foolish pride of hospitality, has done more to prostrate the husbandry of our beloved state, or rather prevent its attaining any high improvement, than all other causes put together. Not that I am an enemy to hospitality properly so called—that I mean, which springs from the heart, and increases *pari passu* with the means of indulging it: no, God forbid. But the kind which is to end in the ruin of those who display it, is not only spurious, but as much to be dreaded and deprecated as the cholera, or any other destructive disease. It begins in vanity, or idleness, or inordinate love of what is falsely called pleasure; and ends in poverty, long-suffering, and ruin; or in the heart-rending abandonment, by emigration, of home, friends, kindred, and the dearly cherished land of our nativity.

[The foregoing communication treats on a subject of much importance, and which greatly needs such comments and strictures, if indeed *any* can have effect. Perhaps every reader, like ourselves, may object to some parts of the details recommended by J. M. G.; but there can be none, who have considered this subject, who will not admit the value and importance of the writer's general remarks, as well as their correct application. We have frequently, but fruitlessly, attempted to call the attention of the members of new agricultural societies, and of those intending to form societies, to the general and similar defects of such associations. Judging from such results as are before the public, our suggestions have been useless; and by their being repeatedly brought forward, possibly may have given offence. As a last effort, we request that every member, or intended member of an agricultural society, who may read the foregoing communication, will also read two pieces which, with similar views, were inserted in the early part of our first volume—"A report on agricultural premiums," at p. 147, and a communication on the "Advantages and defects of agricultural societies," p. 201, v. I. Far. Reg. However, we should be altogether unworthy of conducting a journal devoted to the "support of the interests of agriculture" if we feared to give offence by uttering unpalatable truths in the performance of our duty.

ADDRESS TO THE NORFOLK AGRICULTURAL SOCIETY.

By WILLIAM GARNETT, Esq., President.

Ordered to be published in the Farmers' Register by a resolution of the Society.

Gentlemen—I now avail myself of the first opportunity that has offered, since our organization, to return you my thanks for the honor you have done me, in calling me to preside over the *Norfolk Agricultural Society*. I must, however, be permitted, at the same time, to express my regret that your choice did not fall upon one better qualified to serve you in that capacity. And this disclaimer, I can assure you, is not made merely in compliance with a customary form, but under a thorough conviction, that I can lay no claim to the knowledge, either theoretical or practical, which it is desirable that the presiding officer of such a society should possess. If, therefore, I should be so fortunate as to contribute, in any degree, to the advancement of the objects which we contemplate, I shall be indebted, almost entirely, for such contribution to researches into the recorded experience of others.

In this way, I may perhaps, occasionally, be able to bring to your notice facts which might, otherwise, not be so generally diffused. And, in this way, every member of the society may contribute his quota towards the dissemination of the agricultural information which past experience has accumulated. But we should not rest satisfied here—every day new additions are making to the acquired stock of agricultural knowledge, and it should be our aim, both individually and collectively, to add our mite to the general contribution. To pursue the study of agriculture rightly, we should, as in the case of other sciences, adopt the inductive method, and rest our principles upon the solid foundation of well attested facts, the result of attentive and intelligent observation. And it is the province of societies like ours, to collect, record, and to excite, as much as possible, public attention to the proper improvement of the information thus obtained. To this end, it is hoped, that every member of this association, which we have voluntarily entered into for this purpose, will zealously co-operate. None of us, we trust, will be content to be mere sleeping partners in the concern, but let us rather anticipate that all will be impelled, both by duty and inclination, to take an active part in promoting the objects for which we have associated. Then may we hope to realize benefit to ourselves, and to impart the advantages which we may derive, to others.

But permit me, again and again, to repeat, that we can never calculate upon so desirable a result, unless we pursue the objects we have in view from the establishment of our society, with spirit and activity, and can succeed in exciting in our members generally, an interest in the concerns and operations of this institution, which will induce them to engage actively in the advancement of its welfare. One of the most obvious modes by which this can be accomplished, is by a free communication of all important facts relating to the subject of our science, which may come to the knowledge of any of our members. Much very important and highly useful information, it is to be feared, is withheld from the agricultural community, from an unwillingness that many persons have

to appear before the public as authors, arising from a diffidence of their powers in the art of composition. This might be a good reason for such reserve, if the object of the writer was to make a display of his skill in the art of writing; but where nothing is contemplated but the communication of useful facts, the graces of composition may well be dispensed with. We shall never value the information that may be thus imparted to us, a whit the less for any deficiency in the polish of the style in which it may be conveyed; but will ever prize one useful and well attested fact bearing upon the subjects to which the attention of our society is directed. to the finest theory, which the most brilliant imagination can suggest. All that is requisite in the communications, which we solicit, is a plain statement of the facts communicated, with such of the accompanying circumstances as may be necessary to enable us to draw correct inferences from them. Many of our members, we have no doubt, could aid us essentially by furnishing us with the result of their agricultural experience; and I trust that none, who have the ability, will, like the unprofitable servant spoken of in the scripture parable, prefer to bury their talent, rather than put it into useful circulation.

As may have been anticipated from what was said in the commencement, I have but little worth communicating from the very slender stock of my own agricultural experience; nor have I as yet had the leisure to draw from the sources of information alluded to in the beginning. But there is one important fact in relation to the application of manure upon which I can speak experimentally, and to which I will therefore call your attention, as I deem it much more deserving of consideration than it is generally thought. Some years ago, in reading the proceedings of an agricultural society, somewhere in the state of New York, I observed that the owner of a farm, who obtained a premium offered for the best managed farm in that part of the country, stated amongst other matters in relation to his management, that for many years, he had applied all his manure to the surface of his land after planting his crops, instead of previously ploughing it into the land, as had hitherto been his practice. Since then, I have applied the greater part of the manure I have collected in the same manner, and have invariably found the crops better than they were upon the land where the manure had been used according to the old method. This difference is much more manifest, where coarse litter is used, than in the case of well rotted manure; and of a very dry season, I think I have witnessed a difference of at least one hundred per cent. in favor of the surface dressing, though I have never tested the matter by actual measurement. But during severe droughts I have seen the corn fired nearly to the shoot, upon land into which coarse litter had been ploughed previous to planting, when the corn, which had the manure spread over the surface after planting, was perfectly green and flourishing. In further corroboration of the opinion herein advanced, of the superior advantage of an application of manure to the surface, over the practice of burying it in the land, I will mention one other fact. Soon after the appearance of some essays signed "*Arator*," and written by Col. John Taylor, a celebrated agriculturist, it was the practice of many farmers in the part of the country in which I then resided, to plough up the land, upon which they had penned their cattle during the summer, as soon as the cow pens were removed, to avoid the loss, which he had taught them to apprehend from the evaporation of the manure if left exposed upon the surface of the land to the action of the sun and moisture. Whether from accident, or design, it so happened, that some of the cow pens remained unbroken until the following year, when they were ploughed up to plant in corn; and much to the astonishment of those who had implicitly believed in the supposed loss from evaporation, it was found that this land produced much better than that which had been ploughed as soon as the cattle had been taken off. The consequence has followed, that the practice of breaking up cow pens, upon their removal, has been abandoned in the part of the country alluded to, I believe, without a single exception. From my own experience, therefore, on this subject, as well as upon the testimony of several experienced farmers, whose experiments have led them to the same conclusion, I do not entertain the least doubt as to the superiority of the method of applying manure herein recommended, over the mode formerly used.

With regard to the implements of husbandry, I am not sufficiently acquainted with the state of agriculture in our region to know how far the modern improvements in this particular have been adopted with us. But I have been informed and believe, that very little attention has been paid, in this section of country, to this important branch of rural economy. Being however, almost entirely unacquainted with the extent of our deficiencies in this respect, I will postpone this subject for another communication, by which time I hope to be better acquainted with our wants and the sources from which they can be supplied. But before I take my leave of it, I will briefly describe to you an implement much used in the part of the country in which I formerly resided, in the preparation of newly cleared land for cultivation. It is called the new ground coulter, and differs from those formerly used in that part of the country, in having a blunt edge in place of a sharp one. The advantage gained by this change, is, that the roots are broken, and torn out of the earth, instead of being cut and left in the land; nor it is ever impeded in its progress, by sticking in the roots, as is frequently the case where the sharp edged coulter is used. Oxen are generally employed as better adapted to such work, where frequent stoppages occur, than horses; and a hatchet is carried on the brake of the plough, to chop such roots as are too stubborn to be broken. The new ground coulter is also much used to open furrows for planting corn; and for this purpose two short mould-boards are fixed upon the upper part of the helve, while the coulter going several inches below the bottom of the furrow, opened by the mould-boards, prepares the land underneath, for the reception of the small roots of the corn as soon as it vegetates. Some farmers likewise use this plough for siding corn, in stiff land, preparatory to weeding; but, in this case it is used without any mould-board. In short, I do not know a cheaper or more useful agricultural implement than the new ground coulter, or one by which so great an amount of labor can be saved, at so little cost. I have seen large new grounds completely prepared for the use of the ordinary plough by running this coulter previously through the

land; and the work of 15 or 20 hands, which would have been otherwise employed for several weeks in grubbing and hilling the ground, entirely saved. Mr. Richard Baylor, an officer of our society, has one of them, which I ordered for him, and I have had another made at the request of Mr. A. Foreman, also one of our officers, which will furnish an opportunity to such as think the matter worth inquiry, to examine the plough for themselves. The construction is so simple, that the most ordinary blacksmith can make them by these models. In conclusion, I would remark, that few things are of more importance to the farmer than a judicious selection of the implements of husbandry, both as it regards the economy of labor, and the due preparation of the soil for cultivation. And if I have not been greatly misinformed, much is required in this department to place us upon the vantage ground occupied by our more enterprising and industrious brethren of the north, or even of many parts of our own state. I therefore recommend this subject to your particular attention. Much may be done to better our condition in this respect before we meet again, if we can but infuse new energy into our operations, and excite something like interest in agricultural pursuits in this and the neighboring counties. But candor compels me to add, that if we continue to manifest the same indifference to the well being and progress of our society, which has, so far, characterized our first efforts, we may, at once, abandon all hope of advantage to ourselves, or utility to the public, through the agency of this institution, which without more spirited exertions than have yet been made, we may consider as virtually dissolved.

From the Richmond Enquirer.

PRESENT STATE AND PROSPECT OF THE RICHMOND, FREDERICKSBURG, AND POTOMAC RAIL ROAD.

Richmond, Fredericksburg, and Potomac Rail Road.—The three-fifths of the stock, with the exception of about $70,000 has been subscribed by private capitalists of undoubted responsibility—about $150,000 by gentlemen in Philadelphia—and 5 per cent. actually paid in. The 70,000 dollars will be readily made up, and is pledged to be subscribed, before the state will be called on to subscribe its two-fifths. A bill is now before the House of Delegates to subscribe the two-fifths or $280,000. We entertain no sort of doubt of the value of the investment—nor of the great utility of the proposed rail road to the public at large. We have requested some information on the subject from Mr. Moncure Robinson, the engineer, who has been so obliging as to address us the following letter.

Richmond, Dec. 28th, 1834.

Dear Sir.—I hand you, agreeably to your request, the following information in relation to the Richmond, Fredericksburg, and Potomac Rail Road.

Twenty-seven miles of the road, extending from Richmond to the North Anna, were contracted for on the 27th, (yesterday,) at an average expense of $8,000 per mile. The work was let to contractors of the highest responsibility; and the grading and masonry of this portion of the road, are to be completed by the 1st of July. The rails, it is presumed, may be laid in the course of the summer and fall, so as to admit of the use of this portion of the rail road by the 1st of December next.

It is the intention of the company, if the usual subscription of two-fifths should be made by the state, to place the remainder of the road to Fredericksburg under contract in the month of May or June, so as to insure the completion of the whole road in the course of 1836.

The distance from Richmond to Fredericksburg will be reduced by the rail road from sixty-seven miles to fifty-eight; the time of travelling it, *from fourteen hours to three hours;* and the journey between Richmond and Washington, from twenty-four hours to between *eight and nine.*

The cost of the trip between Richmond and Washington, now between ten and eleven dollars, will be reduced to $6 50 per passenger.

With the facilities afforded to the travel, by the proposed work—in connection with the great line of steam boat and rail road communication between Washington and Boston, now on the eve of completion—the friends of the improvement are sanguine that so large a portion of the travel now taken by packets between New York and Charleston, may be diverted from the coast to the interior, as to afford, immediately on its completion, to stockholders, a dividend of six per cent., *from this source alone.* Independently, however, of the travel, a great trade may be expected on the rail road. The line passes within about 3 miles of the Deep-Run coal field. By a branch to it, coal will be transported from these mines both to Richmond and Fredericksburg; and cotton, now brought by the Petersburg Rail Road, to Petersburg and Richmond, may be expected to be conveyed to Fredericksburg; and the water-power of the last named town made use of, as at Richmond and Petersburg, for its manufacture. In agricultural products, the trade of the rail road will be any thing but inconsiderable. It is true, that the country through which it passes is not generally fertile; but the cheapness of transportation will bring lands into market not now cultivated, and increase largely the amount of its products; and improvements of the North and South Anna Rivers, already projected, or branch rail roads, will extend the benefits of the improvement to the counties of Louisa, Spottsylvania, Orange, and Madison. Whilst the prosperity of our sister town, Fredericksburg, will in many respects be promoted, and cannot be impaired by it, Richmond may be expected, by the execution of the work, to be placed in the relation to her which Baltimore now occupies; and produce, which would otherwise leave the state to find a purchaser, be brought to this place. But a more probable result will be, the improvement of the markets in both towns, in consequence of the facility of intercommunication afforded by the rail road, which will enable the merchants of either town to make purchases advantageously in both.

I will add only in addition to the above, that the definite location of the work, as far as it has progressed, shows that it will be executed at much less than it was at first computed at. The original estimate, based on the experimental line first traced, was $763,000 for the whole work, including the necessary depots, locomotive engines, cars and carriages. Great improvements have

been made in the line, and it is now ascertained that it will not probably exceed $680,000, or *at farthest* $700,000, inclusive of the above items.

I remain, dear sir, yours, very respectfully, and truly,

MONCURE ROBINSON.

T. Ritchie, Esq.

The following extracts from the address of the commissioners, published in this city in May last, will throw additional light upon the value of the proposed improvement:

EXTRACTS FROM THE ADDRESS, &c.

Address of the Commissioners, to the Citizens of Richmond and Fredericksburg, and the inhabitants of Henrico, Hanover, Caroline, and Spottsylvania.

By the report of the engineer, communicated to a committee of citizens of Richmond, on the 4th of January last, it appeared that the distance between Richmond and Fredericksburg, by the experimental line surveyed prior to that time, was sixty and a half miles, and that the whole cost of the work, including depots, warehouses, and water stations, locomotive engines, cars, and carriages, was estimated at seven hundred and sixty-three thousand dollars. The farther surveys which have been since made by the engineer, show that a reduction in distance of one and a half miles may be effected between Richmond and the Pamunkey, by a line terminating in H street, on Shockoe Hill, and the cost of which will be about $40,000 less than that of the line first traced.

The commissioners understand from the engineer that no doubt is entertained by him, that farther reductions in the length and cost of the road, will result on its definite location, so that the whole cost of the road, with all its appendages to Fredericksburg, will not probably exceed $700,000, if indeed it should reach this sum; and that the whole length of the road may probably be reduced to fifty-eight miles.

Presuming these views to be correct, (and that they are so, the commissioners have as a guarantee the professional reputation of the gentleman to whom their surveys were committed,) there can be but little doubt of the productiveness of the improvement, and that as an investment, none which has been offered for many years to the public can be more advantageous.

In confirmation of the above positions, they would respectfully submit,

1st. That every rail road hitherto made in our country for the accommodation of *travel* has been productive.

2d. That the line of rail road in question, would necessarily take, not only the whole travel between the city of Richmond and town of Fredericksburg and the north, and that between the city of Washington and towns of Alexandria, Georgetown, and Fredericksburg, and *the whole south*, and all the local travel on this line, but also the largest portion of *the large travel* between the north and south, now accommodated by the packets on the coast and the bay steamboats.

That the above view is correct, it is only necessary to advert to the fact that the Baltimore and Ohio Rail Road Company are now executing with great energy the branch of their rail road, which is to connect the cities of Washington and Baltimore; and that this work will have been completed in the course of two years from the present time. By means of it and the contemplated improvement between Richmond and Fredericksburg, a travel may be expected to be diverted from the bay and the coast through our towns, and an increase of that on the line of the improvement, the extent of which can only be appreciated by those who have witnessed the vastly increased intercourse produced by similar improvements in other quarters of our country.

In the absence of specific data on the subject, the experience of the Petersburg Rail Road Company furnishes some facts which are pertinent. Previous to the execution of that work the average number of passengers in the line of stages between Petersburg and the Roanoke did not, it is understood, exceed three each way per day, or varied between 30 and 40 per week. Since the execution of that work, the number has averaged generally between 30 and 40 per diem, or from 300 to 350 per week; the increase of the travel on the route occasioned by the execution of the rail road having been nearly in the ratio of ten to one.

Presuming only half the increase between Richmond and Washington that has taken place on the Petersburg Rail Road, or an increase in the ratio of five to one, (and when we recollect the great facilities which will be produced by the contemplated improvement, the estimate seems to be at least a very moderate one,) we should have about 420 passengers per week on the contemplated rail road; or estimating the fare of each passenger at $4, *sixteen hundred and eighty dollars per week*, on the proposed improvement, *from passengers alone.*

With every confidence in the above views, the commissioners respectfully present the following as a probable estimate of the annual receipts on the proposed line of rail road:

For passengers, 429 per week, or 21,840 per annum, at $4,		87,360
For the transportation of the mail,		10,000
On cotton, coal, agricultural products and merchandize,		25,000
		122,360
Deduct for repairs of road, wear and tear of locomotive engines, cars and carriages, and expenses of transportation, 50 per cent.,		61,180
		$61,180

And we have a nett balance of $61,180, or nearly *nine per cent.*, to divide to stockholders immediately on the execution of the proposed improvement.

But there can be no doubt that the above income must largely increase with the growth of our country and its increasing trade and travel. With the facilities offered by the proposed communication for the transportation of coal and cotton to Fredericksburg, there can be little doubt that the last named town will become like Richmond and Petersburg, rapidly manufacturing; and its excellent water power, so readily available, but now so little used, be employed to give a new stimulus to the industry of the country in which it is situated. The effect of an increased prosperity

will be, to extend in a still greater ratio, not only the intercourse between our towns, but that between them and the northern cities; whilst the travel of that class of persons who visit the cities of Washington and Richmond, during the sessions of congress and the legislature, from motives of business or pleasure, may be expected largely and steadily to increase.

The commissioners, looking at the subject in these aspects, can scarcely doubt that in the course of a reasonable period the improvement will produce to the stockholders, in dividends, the maximum (15 per cent.) authorized by the charter; and this maximum, if produced by the tolls, it will be recollected, is completely secured to the company for a term of thirty years after the completion of the rail road, by a clause in the charter, which guarantees the company during that period against all competitions from any rival work.

The above views go to show that an investment in the proposed improvement cannot fail to be *secure and productive;* but other considerations still more decidedly recommend its patronage to the citizens of Richmond and Fredericksburg and the intervening country. To the owners of property between Richmond and Fredericksburg it will insure a cheap and speedy transportation of their products, and of course, a large enhancement in the value of their lands. To the merchants and shippers of both towns, a facility in keeping their assortments complete and in making their purchases and transacting business in either town—to the hotels and boarding houses in both towns, an increased business, proportionate to the largely increased amount of travel. But by the property holders in both towns, the benefits of the improvement will be more particularly felt. Its enhancement may be greater in some than in other portions of each town, but will be felt in some degree in all. H street in Richmond, now so partially built, may be expected to become in a few years, throughout its whole extent, what Broad street in Philadelphia, since it has been occupied by the Philadelphia and Columbia Rail Road, has been becoming so rapidly, a handsome avenue, presenting on either side ranges of warehouses and retail stores, handsome hotels and boarding houses; and the industry of our city and Fredericksburg will experience a new impulse from the foundries and work-shops to which the rail road will give rise. Fredericksburg, in addition, on account of the abundance and cheapness with which all the supplies of life are procured there, may be expected, when an easy communication is procured to and from it, to become the residence of many families of that class in society who are not tied down by the engagements of their members to any particular spot. but left free to select the abode which presents most attractions. But it would be difficult to point out the many results which may be expected to ensue from the execution of the work in question, to the towns which it will connect. Unless the commissioners are greatly mistaken, the productiveness of the improvement as a stock, clear as it seems to them, is its least recommendation.

In conclusion, the commissioners would remark, that the whole amount of private subscriptions requisite to the completion of the work is $420,000 or three-fifths of the capital stock of the company, as there can be no doubt that the state will next winter subscribe the remaining two-fifths; and that to organize the company a subscription of $300,000 is by the charter made sufficient. Two dollars per share is to be paid at the time of subscribing, which sum, of course, will be repaid to each subscriber, if the amount necessary to organize the company should not be made up.

JOHN H. EUSTACE,
FLEMING JAMES,
LEWIS WEBB,
JOHN A. LANCASTER,
JAMES BOSHER,
RICHARD C. WORTHAM,
CONWAY ROBINSON,
WILSON ALLEN,
FAYETTE JOHNSON,
W. S. BLACKFORD,
JOHN L. MARYE,
JOHN DICKINSON,
JOSEPH M. SHEPPARD.

From the New England Farmer.

EXTRACT FROM A DISSERTATION ON MAKING AND APPLYING MANURE, BY JAMES HALE, ESQ.

For which a premium was awarded by the Merrimac Agricultural Society.

It has been observed by a writer on agriculture, that manure stands in the same relation to the farmer, that a stock of goods, calculated to meet the market, does to a merchant. Whether the comparison is correct or not in every point of view, it cannot be denied that manure is an article of the greatest importance to the farmer. It is the intention of the writer to present to the public, in a plain and concise manner, for the aid of the practical farmer, as well as to excite an investigation, a few ideas on the subject of making and applying manure.

MAKING MANURE.

This subject comprehends not only the best manner of saving and preserving the manure, which is naturally made by a stock of cattle on a farm, but likewise the best method of increasing that quantity by the aid of other materials. The manure made in stables during the winter season should be cleanly thrown from the same every day, and the stable floor well littered with straw or refuse hay. The litter, besides increasing the quantity of manure, conduces to the ease and health of the cattle, and increases both the quantity and quality of the milk of cows. The cattle in the winter should usually be confined in the farm yard, and the cows at least should be yarded during the night in the summer season. It is said by practical farmers that three loads of manure, kept under a cover through the spring and summer, are worth four exposed to the air during that time.

The manure made by fatting hogs should be frequently cleaned from the hog house and placed in the yard adjoining—(no farmer should be without a hog yard—) and the sty should be frequently replenished with plenty of straw or other litter.

But the thriving, economical and scientific farmer will not depend solely on the preceding methods for his stock of manure; but, for the purpose

of increasing the quantity of the same, will frequently make calculations resembling some or all of those which follow; and not only make, but actually put them in practice; for, give me leave to observe, that calculations alone will make very little manure.

*The farm yard.** As soon as the haying and harvesting season is over, the farmer should commence collecting a large quantity of brakes, swamp grass, or coarse refuse grass of any description, and, after having removed the manure from his barn yard, spread the brakes, grass, &c. over the whole surface of the yard. There is no danger of getting this covering of too great a depth. It should be suffered to remain in this situation till the next fall, when, together with the dung and urine of cattle with which it is mixed, it makes an excellent manure, and should be carted out and laid in large heaps, for the purpose of being placed in the hills of Indian corn, or potatoes, the ensuing spring. It is believed that this is the most profitable method of making and applying such manure. If used the spring after it is made, it is not sufficiently rotten or decomposed to become the proper food of plants. It may be worth observing that the practice of covering the barn yard with brakes is very beneficial to the cows kept in the yard during the fall season, and is equally as necessary as the stable litter in the winter. These weeds are very injurious to our pastures, and every cutting tends to destroy them.

The hog yard. With a little labor much valuable manure may be made in this enclosure. It is strong, rich and oily, and the fermentation of it proceeds slowly, consequently it affords more steady and durable nourishment to the plants to which it is applied, than most other manures, and answers a good purpose when mixed with a large quantity of earthy or vegetable substances.

For the purpose of increasing the quantity of this manure, the farmer should deposite in his hog yard at every convenient opportunity, chip-dung, rich earth, weeds, leached ashes, leaves, moss, turf, and such other substances as his ingenuity may suggest; for no person should allow himself to be an entire book farmer, or servile imitator. That the mixture of the several ingredients may the more readily and efficiently be performed by the swine, a little corn or other grain should be sprinkled over the yard.

This is a good manure to enrich the exhausted soil of a garden, or to spread on land to be planted with Indian corn; but perhaps the best manner of applying it is to cart it out every spring, and place it in the hills of Indian corn, or potatoes. If the crop be not a good one where this manure is used, we must look for the failure from some other cause than the want of an excellent manure.

The compost heap. Manures combined of different materials, and of such substances as are calculated to act upon each other by fermentation, or otherwise, are eminently useful in increasing the fertility of soils, and promoting the growth of vegetables.

Select some convenient spot not far distant from the back part of your house, or near the barn yard, and cart or place thereon, not in layers, but judiciously mixed or shovelled together, such substances as the following, viz. rich earth, such as may be obtained from ditches or the sides of the road; mud or the dirt from hollows, which have received the wash from rich lands; marl, ashes, oily substances, soot, putrified flesh, dead animals may be buried in the compost heap, if placed at such a depth as to prevent any noxious effluvia; woollen rags cut in small pieces, scrapings of the cellar and kitchen yard, of lanes and back yards after rains, rubbish of old chimneys, earth that has been long under cover, salt, old brine, blood and soap suds. These should be frequently mixed together, and at each stirring much common earth, or that which lies adjoining the heap, may be added. If this manure be designed for a cold, stiff, clayey soil, sand or dry sandy loam should be a principal ingredient; but if for open, light, sandy ground, clay should be added. It would be well to add to the heap some warm manure to promote its fermentation; sheep dung would be the best. Straw, refuse fodder, brakes, or any such vegetables, would be better disposed of in the barn yard than in this heap. The making of such a heap causes an appearance of neatness to exist about the house and other buildings; and besides being a rich manure, the removing of so much rubbish to its proper place is conducive to the health of the occupants or inmates of the house.

This is a good manure to spread on tillage land, just before sowing it with wheat or any kind of grain and hay seed. It should be covered in the soil with the harrow. It will cause the grain to grow luxuriantly, and the land seldom fails of being well stocked with grass. It may be profitably applied to gardens, and as a top dressing to wet, cold mowing lands.

Peat moss, or swamp mud. This is a substance which yields little or no nourishment to plants unless it be mixed with barn yard or stable dung, or some kind of hot manure to bring it into a state of fermentation; in this case the mixture may be used in the same manner and nearly to the same effect "weight for weight as barn yard dung."

The cheapest and best manner of making this kind of compost manure is, when the barn yard dung is carried into the field early in the fall, a certain quantity, say one-half, or even two-thirds of the heap may be composed of swamp mud, which should be well mixed with the other manure. The whole mass at this time will undergo a strong fermentation, and become a good manure. Some practise carting swamp mud into the barn yard; but in this case the two kinds of manure will not so well assimilate by fermentation, as when they are both moved at the same time and mixed together. The mud should be removed from the swamp, and left to dry some weeks before it is carried to the compost heap. I tried some of this compost in the hill for corn and potatoes, on a dry warm soil; it consisted of nearly two-thirds mud; it did well with the potatoes, but with the corn, barn yard dung had the advantage, though in this case the mixture was probably beneficial.

APPLICATION OF MANURE.

In addition to what has been before remarked

* This enclosure is usually denominated by the farmers a barn yard, and this appears to be the most proper designation; but most writers on agriculture call it a farm yard.

on this subject, some further observations will be made, founded on information derived from my own experience, the best authors, and the most intelligent agriculturists.

Stable dung or animal manure ought to be spread on tillage land designed for corn or potatoes the spring after it is made, and well mixed with the soil, by the harrow first and then the plough. This mixing of the dung and soil should be performed immediately after the manure is carried from the heap to the field. If the small heaps are suffered to remain in the field during a fermentation, there is great loss of heat, of volatile fluid, oily, and gaseous matter, by their dissipation in the atmosphere, which would, if the dung be speedily and properly buried in the ground, be communicated to the soil, thus securing to the plants the most nourishing properties, and the whole strength of the manure.

As it respects their speedy application, the same remarks apply to all kinds of manure, as well as to that of stable dung.

Some are of the opinion that stable and farm yard manure ought always to be applied in a recent state, that is, previous to their rotting or decomposition. In this case the manure must be spread on the land as above directed, as new dung will not answer a good purpose to place in the hill for Indian corn; and it is not so good on most soils for potato hills, as that which is somewhat decomposed and rotten. Barn yard dung may profitably be applied, as before observed, in the hill of corn and potatoes; and if so applied it should not be applied in a recent state.

With regard to the quantity of manure to be applied to an acre of tillage, many circumstances must be taken into consideration, such as the strength of the soil, the kind of grain or produce to be raised, (Indian corn requiring the largest quantity) and the kind or quality of the manure to be applied. The farmer, in making his calculations on this point, should not apportion his manure to the quantity of ground he may wish to place under tillage; but should apportion his ground to the quantity of manure he can command. "Scanty dressings," as the term is, should ever be rejected. "We till too much land," is an expression in very common use; but instead of being a vague speculation of the brain, it should be reduced to the actual practice of the hand.

In the speculation of manure, the quality of the soil and of the manure should be considered. A cold, stiff, clayey, or wet soil requires a hot fermenting manure, and one not much decomposed, and that too in considerable quantity, that the cold nature of the soil may be corrected by the warmth of the dung; on the contrary, a dry, warm, sandy soil requires dung more decomposed and putrified, and a less quantity answers a good purpose. On such soils a compost of dung and peat moss, as before described, is a very suitable manure.

REMARKS ON AGRICULTURE, VEGETATION, &C.

To the Editor of the Farmers' Register.

Nothing is of more importance than the cultivation of the soil, and improvement of agriculture. I have read with pleasure and satisfaction many communications on this subject, in your useful paper. It is indeed pleasing to see gentlemen of the first standing in society, come forward and give information upon this all important subject. I hope they will go on and use every exertion to promote the welfare and happiness of the Old Dominion. We have paid but little attention to agriculture: indeed it has been most shamefully neglected. The reason appears obvious: we have more land than we can cultivate, and there will be a waste until necessity compels us to improve. What, I might ask, has been the mode of cultivation for a century past? It has been, to get as much land cleared as possible, make a few indifferent crops, and pay little or no attention to it afterwards. In a few years the soil is carried, by frequent washings, down hills, branches, creeks and rivers, until it reaches the Atlantic; the steril earth and gullied fields put up pine, and ultimately the inhabitants are driven from necessity beyond the mountains. This Virginia can witness; and I am sorry to say, many of us are going on in the old way, without any ambition to excel our predecessors. It is true, we have some industrious characters, who are disposed to benefit society free from self interest, and it is much to be regretted, that this laudable spirit is not more general.

Nothing is wanting but a correct system of agriculture, to make us the most independent people upon earth—we should therefore endeavor to improve this great science, and supply, if possible, the general and lamented defect. I feel disposed to call upon the enlightened part of the community, to use their influence in producing a change; they alone have it in their power, and if they will use exertion, they can effect a revolution in a short time. Let us then take in consideration all that relates to the cultivation of the soil, although it may require years to perfect the great object.

The earth is a mean by which plants are supported and nourished. There are five primitive earths which are generally found in most countries, viz. silex, lime, magnesia, alumine and barytes; by a particular union of these earths, are formed the great variety of stones observable on the surface of our globe; in many instances, they are united with various acids, forming salts. The gypsum, for instance, is a salt composed of the sulphuric acid and lime; all the rock, lime, shells, and various marbles, are salts composed of the carbonic acid and lime. These earths taken separately, are unfit for vegetation. Silex retains heat and is destitute of moisture; argillacious earth, cold and humid; calcareous earth caustic, and gives out water too freely; magnesian earth, steril and destitute of any active properties. They are, however, so opposed, that they correct each other when united. Farms abounding with argillacious earth, may become productive by the addition of lime and plaster: by this union, the lime is robbed of its humidity and the adhesive quality of the clay destroyed. The earths taken separately, will not constitute manure, and we have to study the soil before we attempt the improvement. The great secret in agriculture, is a proper union of earths, together with various agents to be named hereafter. The good effects to be derived from the primitive earths, must be owing to the affinity which they have for each other; atmospheric air, water, vegetable and animal productions, hasten-

ing decomposition. In consequence of this affinity, a great variety of gases are the immediate result, which act as stimulants on the tender germ or root of plants; so that the earths afford no real nourishment in themselves, but act entirely as exciting agents—they decompose every thing for which they have an affinity. In consequence of this, a number of gases are evolved, and when united, form various fluids, such as sap, sugar, water, oil, and mucilage. By this union plants are formed, their growth depending upon the facility with which the productions of the earth are decomposed. The rapid growth of plants, or their tardiness, must depend upon hasty or slow decomposition, for unless some animal or vegetable putrefaction is taking place constantly upon the earth's surface, plants cannot subsist. This observation is applicable to the animal, as well as the vegetable kingdom, for nothing can exist except it be from something which had previously perished. Composition and decomposition are continually taking place; and without it, there can be no vegetable or animal matter.

To be successful in making a crop, many things are to be taken in consideration. First, we must have rich earth, for without it, there can be no luxuriant vegetation. The prosperity of the plant depends upon a variety of causes. We should endeavor to learn what kind of manure has the greatest affinity for the earth we have in cultivation. The soil should be properly prepared before we attempt the seeding, for unless this is done, it would be a vain effort to produce an effect without a cause. I beg leave here to drop a hint to Virginia farmers and planters; they cultivate too much poor land, and labor hard for little profit. If they would manure their lands, and cultivate half the quantity, they would have full barns and fat stock; as it is, they have empty corn houses and lean kine. It is, however, the disposition of Virginians to hold out appearances; if they can give you the outline of a large field of corn or tobacco, they seem perfectly satisfied, knowing that it will not be filled up. From two acres of ground, under favorable circumstances, a planter will make 1000 pounds of tobacco: when carried to market it is found defective in quality, and sold at the reduced price of $5 per cwt., which amounts to $50: whereas, if the same labor and manure had been given to one acre of land, 1000 pounds of tobacco of the first quality would be made, and of course it would command the first market price, $10 per cwt., which amounts to $100: thus it is, that the planter labors hard throughout the year, and yet finds himself poor.

The next thing to be taken in consideration in making a good crop, is select seed. The seeds of vegetables are a sexual offspring, corresponding with the eggs of animals, and contain like them, not only the rudiments of new organization, but also a quantity of aliment laid up for its early nourishment. (See Darwin's Phytologia). When seed is deposited in the earth, having a due degree of heat and moisture, it soon begins to germinate; the germ has a number of small umbilical or seminal vessels, which in a short time imbibe fluids from the earth and atmosphere; they are excited into action by the stimulus of fluids which come in contact with their mouths: the germ at length begins to unfold itself and we observe the trunk, leaves and branches, having a number of arteries, veins, muscles, tendons, nerves, glands and absorbents. The plant now requires the necessary agents to act upon it in order to produce its evolution.

The third consideration in making a crop is judicious culture or proper manual labor. The plough hastens decomposition by exposing the various matters in the earth to the action of the sun and air: this causes a greater affinity to exist between the principles which go to the nourishment of vegetables. It likewise leaves the earth loose and suffers the tender roots to creep along in search of food. When the roots extend any distance from the hill or stalk, they should not be broken, for this would retard the growth of the plant, by cutting off a portion of its nutriment; this is not all, every wounded root produces disease in the plant, and it must require some time before it is capable of healthy action. It not unfrequently happens, that we fail in making a crop, and ascribe it to drought or wet, when it was owing entirely to our own imprudence, that of injudicious culture.

A due degree of heat is necessary to the well being of all vegetables. The temperature *most favorable* to vegetation, has not, I believe, been correctly ascertained; but I suspect a temperature varying between 55 and 85 degrees of Fahrenheit's thermometer is best. There should be a degree of heat sufficient to keep up vegetable and animal putrefaction, in order that the plant may constantly receive a certain portion of aliment. A high temperature decomposes the various matters of the earth too rapidly, and carries them off in the atmosphere, before the plant can get possession of them; it also robs the earth of a certain portion of moisture necessary to vegetation.

Plants, like animals, cannot live without water; they require a drink when thirsty; they decompose water, and its components form some of the rudiments of plants; other gases enter into their composition no doubt: but I am well assured, water must be decomposed before it gets possession of the vegetables; otherwise, plants would be composed principally of that fluid. Water is a compound of oxygen and hydrogen in certain proportions, and it may readily be imagined, that it is by various affinities reduced to its principles, giving organization and fluidity to the vegetable world. Plants receive their nourishment from water, through the medium of the earth, which acts as a filter, and carries with it, while in a state of decomposition, certain principles, which are the immediate product of decayed animal and vegetable productions. Insects that are continually dying on the surface and in the earth, support plants; for when we consider that it contains such a variety of animals, visible and invisible, that every spire of grass, every leaf, and all kinds of matters are loaded with insects throughout the vernal, summer, and autumnal months—that one generation is succeeding another continually—all this I say seems to be a plain proof, that the vegetable world must be in a great measure supported by them. Such an idea may seem visionary, but it cannot be doubted, unless we deny the existence of principles from the earth which go to the nourishment of plants. Atmospheric air, is one of the vegetable supporters. They, like animals, cannot live without it, although the air they feed upon, is somewhat different from that

required for the animal creation. Nitrogen gas supports vegetable life; plants are observed to be vigorous in proportion to the quantity of this gas present. Carbonic acid gas is an agent that supports vegetation; plants are healthy in earth mixed with finely levigated charcoal. As plants acquire growth, their principles are materially changed. We first observe nothing more than a thin fluid resembling mucilage. As they acquire age, this mucilage is changed to a substance resembling oil, known by the name of sap, from which all the fluids are formed by secretion. There is a wonderful similarity between the vegetable and animal world; they are both governed by the same laws, the various agents that act upon them are similar, their organization in many respects the same, and they both possess motion, sensation and life.

GALEN.

REMARKS ON AGRICULTURAL SOCIETIES, AND THE FARMERS' REGISTER AS AN AUXILIARY.

To the Editor of the Farmers' Register.

I had been long anxious to see an organ, for the conveyance of agricultural information, like that presented in the Farmers' Register: and as I had abandoned the culture of tobacco, for the sole purpose of improving my farm, it comes in a time of need, and I shall want all the materials it can furnish. We do indeed, sir, want something for the improvement of the *practice* of agriculture. We want facts founded on certain, accurate, and well conducted experiments. I think with you, we have inefficient talking and speechifying societies enough: where to use an old saying, we have "all talk and no cider." These societies are easily formed, and as easily exploded. I would by no means, however, decry agricultural societies; they are very useful, in fact all-important, to keep up a spirit of improvement, if they effect nothing else. Nor am I opposed to the principle of carrying important points by societies in general: without them nothing valuable can be accomplished. Man, like some of the inferior ranks of animals, may be considered gregarious—compelled from necessity to associate, for mutual support and defence. What is man unassisted, unassociated, and alone? Look at him as he appears at his first entrance into the world; he is of all animals the weakest and most defenceless. But view him in society, hedging himself around with the accumulated knowledge and experience of ages, yet, in a state of progressive improvement, (which appears to be the most distinguishing feature by which his intellect is marked from inferior ranks,) and he bids defiance to the whole round of animated nature, and wields the whole vegetable kingdom for his convenience and support. Take a savage, for instance, in the midst of his wild native woods, and how long would it take him to arrive at the present state of improvement in the arts and sciences? "If men did not assist each other, no operation of any magnitude, or which could show any great superiority of talents above those of the brute creation, could possibly be effected. A single family, or even a few families united, like the carnivorous animals, might hunt their prey and procure a sufficient quantity. They might, like the bear, lodge in the cavities of trees; they might occupy natural caves in the rocks; they might even build huts with branches of trees and with turf, and cement those materials with clay. This lowest and most abject view of human nature is not exaggerated. It were to be wished that this grovelling condition of mankind were fictitious, and that, in many regions of the globe, it did not at this moment exist. These operations of men, when only acquainted with the rudiments of society, indicate parts little superior to those of brutes. Man even in his most uninformed state, possesses the capacity for every species of knowledge and every exertion of genius. But it may be cherished, expanded, and brought gradually to perfection. It is by numerous and regularly established societies alone, that such glorious exhibitions of human intellect can be produced. What is the hut of a savage, when compared to the palace of a prince? Or what is a canoe, when compared to a first rate ship of war?"

But, sir, the failure of these societies, when they have failed, may be attributed generally, to some of the following causes. First, they commence reformation, as almost all reformations of mankind do begin, not by improving on existing plans and systems, but an entire abolition of present practices, as if all the world who had gone before us lived for nought, and labored in vain. The following couplet is a good rule here—

> "Be not the first that new things try,
> Nor last to lay the old ones by."

They spend all their zeal and energy, in talking about what they are going to do, without actually doing. They expect too great a reformation at once—they lack perseverance—are generally too speculative and theoretical in their character, and finally, the want of some agricultural paper, has been no small obstacle, to act as a kind of nuclus to keep these associations together, and to confine public attention to the subject; and which will, at the same time, convey their proceedings, improvements, discoveries, and inventions to each other, and the community. With these and other errors corrected, by close and minute attention to the operations of our farms, great things may be accomplished.

I am delighted, however, with the *practical* character of the Register, and particularly with the following traits. Its extreme condescension to little matters, which are generally the most useful, though overlooked in house-keeping and farming. It has been too much the defect of books and periodicals in general, as well as of great men, that they disdain the common and useful concerns of life, and go to speculating upon matters that are of no service to mankind: and are more admired for the strangeness and uncommonness of the things they treat of, than their utility. In a word, their concern with every thing which mankind have no use for, and nothing, which they have. They are, likewise, too general in their character; not minute enough, as Goldsmith remarked of the natural historians who preceded him. "They contented themselves with seizing upon the great outlines of history, and passing over what was common, as not worth the detail; they only dwelt upon what was new, great, and surprising, and sometimes even warmed the imagination at the expense of truth." I should be

fond to see agriculture reduced to something like a system, and like medicine and other sciences, have its theory and its practice, its botanical names, its technical language, &c.; but not all theory and no practice. We need a reformer, sir, and a reformation in agricultural science, such as Bacon was, and such as he effected in natural philosophy: who after the world had been bewildered, and I might add bewitched, by vain speculation for centuries, substituted experimental, in the room of speculative philosophy; and taught mankind, that observation and experiment were the great fountains of human knowledge: and I know of no other means better calculated at present of effecting this change among us, than you and your Register, to which all should endeavor equally to contribute, how feeble soever their efforts and humble their attainments, if they wish it to live to a good old age.

There is another feature of the Register with which I am remarkably well pleased; that is, its passing by the imperfections of style and language, and publishing useful matter, from whatsoever quarter it may come. Writing, sir, is a troublesome thing to many of us, and authors are something like sparrows, they are ever dreading the hawk-eye of the critic; and if we are to write, then scratch out and write again—look in the dictionary—ransack our imaginations for images, to write about common sense matters; then revise and correct, &c.—we presently become weary, and find not a little of our time slipping away. But if we can only give you the matter, without much regard to the manner—the chaos, and let you make a world of it—you will hear from some of your friends a little oftener. I have little doubt, that there is a vast deal of sound and useful knowledge, suppressed among the best informed and practical farmers of your subscribers, for fear of meeting with the eye of the critic where the great mass of matter lies, which is to feed the Register and keep it alive; and where we must look chiefly for support of the practice of agriculture. This is its strong hold: the most elegant writers are not always the most practical farmers; on the contrary, we are too often, by attempting a pretty style, or at least a studied one, betrayed into poverty, and sometimes even into entire loss of thought. I do not pretend to say that these two qualities may not be admirably combined, as they are by some of your correspondents. We like to see good language, as well as botanical names and technical words introduced into agricultural instruction; for it could be wished that agriculture like chemistry, had its technical language, that the same words were always used to convey the same ideas, and its language was not so vague and indefinite, sometimes using one word (as "fallow") to convey several different ideas, and several words to convey the same idea. But as each one has words and phrases peculiar to himself, in this infant branch, we wish those who first introduced them, would explain themselves to simple and plain farmers, for actually there are some, who write so philosophically and learnedly about common matters, that at first it appears to be something the world never saw, and when we come to find it out, it is something we have been used to all our lives. Simple subjects, says a good author, should be treated with simple words, and we ought not to "hedge around plain and simple matters with hard words, accumulated distinctions, ostentatious learning, and disquisitions that produce no conviction." The cultivation of different crops, and the variety of pursuits among planters, farmers, and graziers, &c., living at a distance from each other, in different climates, and under different circumstances, in countries at different stages of improvement, introduce among them, in the extensive subject of agriculture, a certain slang of words and phrases, that are not always understood by their brethren pursuing a simple branch, and living in a different county, and therefore needing explanation, that others should be benefited by their remarks. And here, by the by, is one excellent characteristic of the Register, it appears to be better acquainted with our pursuits, and manners, and customs, and while we are reading it, we seem to be reading about our neighbors.

There is still another feature which I cannot forbear to commend, and that is, the illustration of subjects by engravings, &c., which are not easily done by words. There are subjects, it is well known, such as those that treat of implements of husbandry, machinery, accounts of animals, &c., of which all the verbal description in the world, would fail to give us a proper idea; in such cases, a simple drawing would aid the understanding more than volumes of words on the subject; besides saving a good deal of room. The admirable portraits you have given us in No. IV, is an example of this, a single glance at which, will give us a better idea of the qualities of a good bull or cow, than folios on the subject. "Mr. Locke (says Goldsmith) with his usual good sense, has observed, that a drawing of the animal taken from life, is one of the best methods of advancing natural history; and yet most of our modern systematic writers, are content rather with describing. Descriptions (continues the last author) no doubt will go some way towards giving an idea of the figure, but they are certainly much the longest way about, and as they are usually managed, much the most obscure. In a drawing, we can at a single glance gather more instruction, than by a day's painful investigation of methodical systems, where we are told the proportions with great exactness, and yet remain ignorant of the totality. In fact, this method of describing all things, is a fault that has infested many of our books that treat on the meaner arts for the last age. They attempt to teach by words, what is only to be learnt by practice and inspection. Most of our dictionaries and bodies of arts and sciences are guilty of this error. Suppose, for instance, it be required to mention the manner of making shoes, it is plain that all the verbal instruction in the world, will never give an adequate idea of this humble art, or teach a man to become a shoemaker. A day or two in a shoemaker's shop, will answer the end better than a whole folio of instruction, which only seems to oppress the learner with the weight of its pretended importance: we have lately seen a laborious work carried on at Paris, with this only intent, of teaching all the arts by description; however, the design at first blush seems to be ill considered, and it is probable, that very few advantages will arise from so laborious an undertaking. With regard to the descriptions in natural history, these without all question, under the direction of good sense, are necessary, but still they should be kept within proper bounds; and when a thing may

be much more easily shown than described, the exhibition should ever precede [or accompany at least] the account." It is desirable, therefore, that in original pieces, those who treat on subjects of the nature above mentioned, would ever accompany them with drawings, especially if the invention is entirely new.

But not to trouble you any longer, sir, with remarks of so general a character, for which my admiration, and sincere desire for the utility and success of the Farmers' Register, only could attone, permit me to make use of your valuable organ, besides, for a few other little fragments of facts, which you may register as you think proper. I begin with a

NEW MODE OF PRESERVING SWEET POTATOES,

which I practiced last winter with complete success. Though one experiment alone, would seem insufficient to establish a fact under all circumstances, yet success in the first instance invites repetition, and all those who wish may try it this winter, as it is extremely cheap and simple. It is to keep them in hogsheads, surrounded with straw stacks, fixed as follows:—

Erect a circular platform of earth, about a foot from the common surface, about the area of the end of a hogshead, with earth dug out of a circular ditch around the platform; then spread some straw or chaff on it, and set the hogshead thereon. Now pour in your potatoes on some chaff or straw, placed at the bottom of the hogshead inside, to within a foot of the top, taking care to chink in straw or chaff between the potatoes and the staves as you fill it, and sprinkling some also, occasionally, between the potatoes, to absorb the redundant moisture arising from them while sweating, or any that may adhere to them when put up. The cask may be placed in the middle of your potato ground; and the potatoes must be spread and dried, about a day before stored—when the dirt dries on them, is a good rule to go by. After this, insert three stakes equidistant around the hogshead, and erect straw stacks around them, in the common way; with this difference, that a man must be walking the whole time the stack is making, around the hogshead, ramming in the straw close and tight against the side of it, to prevent the admission of cold air. The design of the stakes is to steady the stack, and to confine the straw around the hogshead. If the potatoes are for table use, a hole may be made near the bottom of the cask, large enough to admit the arm easily, through which they may be taken at any time; taking very particular care to cram straw and chaff in the hole afterwards. My potatoes, put up in this way last winter, when disturbed for planting, were perfectly sound and plump, and free from that disagreeable scent and odor, contracted in a kiln of earth. Sweet potatoes may be preserved in heaps on the firm stable-yard, covered with manure, by which they are kept warm—in pits in the ground, with chaff, leaves, &c.—in kilns of earth—in hogsheads in a smoke-house, a certain length of time, kept warm by the fire and smoke. But the method above mentioned, is far preferable to either, being the cheapest, safest, and best for preserving the taste and plumpness of the root. They may also be kept in potato houses, and cellars in cabins. I might have mentioned, the principle or rationale of this practice is, that while the cold air is excluded, the potatoes are not smothered for want of air, to dry off the sweat, and prevent heating: the material with which they are protected, being at the same time, airy and warm enough: too much air, or too little, are the two extremes to be avoided in preserving this root.

DRIED FRUIT,

such as peaches and apples, &c., may be elegantly preserved by heating before storing. This destroys the eggs and worms that are deposited on the fruit while drying, by flies, that afterwards corrupts the fruit. The fly frequently deposites instead of eggs, the living worm—this I have seen myself.

POSTS

for railing, gates, &c., may be preserved for a much greater length of time, by making them without buts, or shoulders. It may be observed, that posts always begin to decay at the surface of the earth; the reason of this is, the shoulder catching the water that trickles down the post, it remains there for a long time, soaking into, and rotting the wood, till it finally tumbles to the earth. This has been attributed to the wood maggot; but in truth, this insect comes after the post begins to decay, to feed on the rotten wood, its natural food. It may be objected, that the post in this way is not so firmly fixed in the ground; but this may be remedied by gravel, and ramming. Even a pine post fixed in this way, will out last several oak ones. Pines skinned the proper length, by using a ladder to ascend them, and permitted to stand a year or more, will make handsome and durable posts, (perhaps as much so as cedar.) By leaving a circular strip of bark, about a hand's breadth, to keep the sap in circulation, (which part may be afterwards painted) the tree becomes coated with a thick layer of rosin, which when exposed to the atmosphere, becomes white as if painted. The inserted end of the post, is to be sawed off even and smooth, smeared thick with tar, and a board nailed on it; this and the light-wood around the post, which is an inch or two deep, will preserve it.

TAR—THE PINE TREE—WOOD FOR FUEL.

Tar may be made in abundance from the light-wood of pines treated in the manner above.

The utility of the pine tree, (I mean the field pine) would furnish a subject for a good essay: there is no tree of the woods, which at first sight is apparentiy so useless, yet is more useful than the pine; nor any one thing, scarcely, that is applicable to a greater variety of purposes. It furnishes coal for the shop; tar in abundance, which is here made from the knots, but in North Carolina from the green wood also, called green tar, which is inferior to dry tar, being thinner, and containing a good deal of water, and pyroligneous acid, which acts upon the metal. It is made there from the pitch pine *(pinus palustris.)* A pile of the pitch pine twenty feet in diameter, and fourteen feet high, yields 200 barrels of tar. In Sweden and Norway, it is made from the Scotch fir, *(pinus sylvestris)* where being manufactured in brick furnaces, it is cleaner and more marketable. All the French and Bourdeaux tar is made in this manner, from the sea pine, *(pinus maritima)* after the trees have been exhausted of turpentine, by in-

cision; as is also much of the American. The carter and waggoner, the varnisher and painter, the manufacturer of gunpowder, of soap and candles, the shoemaker, brush maker and tinner, the blacksmith, and more than all, the farmer, is indebted to the pine. Tar furnishes a very good varnish for vessels, and rosin is made from it, by burning down or boiling it. Turpentine is made on a large scale, by incision of the living pine, that is afterwards used for tar. The pine affords a good material for rails, which although not as durable as oak or ash, yet being more abundant, more easily cut, and more yielding to the wedge, it is a cheaper timber, especially if we add to their durability by skinning before mauling, or permitting to he afterwards a while, until the bark (which rots the rail) will slough off in handling. It is certainly the quickest of all restorers of an exhausted and impoverished soil, where the land is put upon its own resources for restoration, since it is dependent upon the soil for but very little support, the roots drawing their nourishment far beneath the surface, from the clay, or subsoil; (whereas clover, or other vegetation, needs a start first from the soil, by manuring, before it can enrich the earth much;) and by being again felled on the land, by their shading influence, which mellows the earth, and in conveying a powerful coat of vegetation, besides its fertilizing property, sooner than any thing else, restores the land to its original strength. It affords also the best material for retaining the soil, for stopping gulleys, and seems to have risen up around these awful cavities, bequeathed us by our ancestors, for the very purpose, as well as a kind of gloomy reproof, of their land destroying system. It may be worth while to mention, that the tops and limbs of the pine is the very best stuff for repairing the breaches of dikes, dams, &c. The pine affords the cheapest and most economical *fuel*, and is decidedly the best wood for burning bricks, making the hottest fire, and free from the damp rainy vapor, arising from green wood, which half the time puts the fire out, acting as so many pails of cold water. According to Mr. Bull's experiments on forty-six varieties of wood, and twenty of coal, it appears that the dry pine wood, (which has received more philosophical attention than some would suppose) affords as much heat as eight of them—that is, the white ash, apple tree, American chestnut, white elm, shell-bark hickory, mountain laurel, Lombardy poplar—and more than all the rest. The experiments were made by ascertaining the time 10° of heat were maintained, above the common temperature, by the combustion of one pound of each article, burnt in a sheet iron cylinder stove, with forty-two feet of two inch pipe, in a room where a thermometer was placed. The experiments were extremely accurate: the heat was maintained 6 hours 40 minutes. The pine used was of different kinds—red cedar, *(juniperus Virginiana,)* Jersey pine, *(pinus inope,)* pitch pine, *(pinus segida,)* white pine, *(pinus strobus,)* yellow pine, (soft) *(pinus mitis:)* the last kind mentioned, the heat rather less than the others, 6 hours 30 minutes. The other wood maintained it different degrees, but all less than the nine above mentioned.

Pine, as all other kinds of wood, should be burnt in a dry state; for these reasons: First, dry wood affords more heat. Several experiments made by Count Rumford, show the effect of dry wood much greater than that of unseasoned wood. Unseasoned wood contains one-third of its weight of water: with his improved boilers, Count Rumford made twenty pounds of ice cold water boil, with one pound of dry pine wood; the same weight of pine wood unseasoned, would produce less effect by one-seventh; one in every seven pounds of green wood is, therefore, lost in combustion, in the fire place. It was ascertained by Mr. Bull, that 100 pounds of green white oak contained 41 pounds of moisture, and that 13¾ per cent. of the combustable matter of this green oak is consumed, in converting 41 pounds of moisture into steam, or driving it up the chimney; and of course, in all ordinary cases, is a dead loss. We may calculate then, to lose 13¾ per cent. of heat in every 100 pounds of green wood we burn.

Secondly, the great quantity of heat that is absorbed by this aqueous vapor or steam, after it is driven from the wood. Green wood, it was found by the last author, is nearly twice as heavy as dry or seasoned wood: soft maple, it was ascertained by him, lost 48 per cent. in drying. "If we assume then (says he) the mean quantity of moisture in the woods, when green, as 42 per cent., the great disadvantage in attempting to burn wood in this state must be obvious; as in every 100 pounds of this compound of wood and water, 42 pounds of aqueous matter must be expelled from the wood; and as the capacity of water or absorbing heat is nearly as four to one when compared with air, and probably greater during its conversion into vapor, which must be effected before it can escape, the loss of heat must consequently be very great." In fact, I incline to think, that the weight of green over that of dry wood, is much over half, if all the moisture was expelled; for I do not consider the moisture entirely expelled, until the wood is converted into charcoal; if so, then as 100 pounds of dry pine wood contains only 23.75 parts of coal, according to experiments, we have but 23.75 per cent. of combustible matter in 100 pounds of dry pine, to produce heat or fire; for all the heat that is given out, in burning wood, is owing to the charcoal it contains. What a quantity of heat then is absorbed by the aqueous vapor of 100 pounds even of dry pine, for if we subtract 23.75 from 100, it leaves about 77 pounds of aqueous vapor, smoke, pyroligneous acid, &c., to absorb and carry off the heat. But the effect is still greater with green wood. If 100 parts of dry pine yield but 23.75 of charcoal, and 100 pounds of green wood contain 41 pounds of water, then 100 parts of green pine, will yield but 12 parts of coal, which is all the combustible matter we have, to produce heat in 100 pounds of green wood; and if this be taken from 100, it leaves 88 per cent. of aqueous vapor and smoke, to absorb the heat and carry it up the chimney; and 88 per cent. of heat is lost in burning green wood in an open fire place; which agrees nearly with the results of Dr. Franklin, that the old open fire places, lost 95 per cent. of heat; and with Mr. Bull, that even in the present improved Rumford fire places, there is a loss of 90 per cent. But besides the heat lost in green wood, in converting the sap into vapor, and by absorption, it requires an additional quantity of combustible matter, or dry wood, to expel enough sap from the wood, to set it a burning, or in other words, to kindle it. Unless this

heat then absorbed and carried off by the particles of aqueous vapor or steam, is confined in the apartment, (as it may be done by close stoves and pipes, for steam is extensively used in heating rooms) it must be entirely lost: some idea of which loss may be formed, when we consider that one cubic inch of water, will expand into 1728 cubic inches of steam; and of course, one cubic foot of water or sap, (which weighs 62½ pounds) will swell out, or expand, into 1,388,400 cubic inches of steam or watery vapor, carrying off with it, an amazing quantity of heat into the atmosphere; which is necessary to uphold it in its expanded state, and if suddenly condensed by cold, will be again given out.

Thirdly. A great number of smoky chimneys may be cured by burning dry wood; for as many of them smoke, chiefly at the kindling, or making the green wood burn, if dry wood was used, it would burn off immediately, and by producing a draught, would dispel the smoke up the chimney.

Fourthly. *Less* wood is required, to produce the same fire or degree of heat. The common opinion is, that it requires more of dry than of green wood, to make the same fire. But when we consider the quantity of dry wood required to set the green wood on fire, and keep it burning—the slow combustion afterwards—the quantity of heat lost by expelling the water from the wood—and the vast quantity absorbed or swallowed up by steam —it must require a great deal less of dry, than of green wood, to generate the same uniform degree of heat, or quantity of fire.

Fifthly. It is certainly more *healthy* to burn dry wood, especially in sick rooms. Few persons seem to have considered the impropriety of putting wet or green wood on the fire place, considering the great volume of watery vapor that is expelled from it. If wetting or washing the hearth, or the drying of wet clothes before a fire, be deleterious to health, certainly the burning of sappy, or at least wet wood must be.

Sixthly. It affords much less *soot* when seasoned wood is burnt; for, producing a greater degree of heat, it consumes more of the soot, and this heat, of course, causing a stronger draught, the residue of the soot is driven out of the chimney: besides, not half the soot is formed; for as soot is the unconsumed particles of the matter of the wood, produced by a slow and imperfect combustion, it is almost entirely consumed in the quick hot fire produced by dry wood.

Seventhly. The combustion is more rapid, and of course the heat is greater. Other reasons might be assigned, but it is sufficient to mention at present, that the draught is stronger and better in a fire place where seasoned fuel is consumed: and as the management of a fire place depends wholly upon this, it will further appear, how much advantage the seasoned, has over that of the unseasoned wood, from considerations on the construction of the fire places.

From this it would seem that there is little reason, or at least little economy, in spending so much combustible matter, (or in other words, using so much of the wood, in drying the balance before it can burn) when this could be done in the sun and wind, and the balance used for fuel.

We might also from these facts, improve our economy in clearing land; instead of burning the wood in heaps as usual, stack it to season it, and it will be good for twenty years or more.

But these remarks are more applicable to pine wood, which although unfit for fuel in a green state, yet when dry, gives as much heat, and perhaps more, than any of the woods in common use for fuel, such as oak, hickory, &c., and certainly more than all the swamp woods. For this purpose it might be belted and allowed to stand, or cut down, mauled, and stacked.

NICHOLAS E. READ,
Twittie's Creek, Charlotte County.

EVILS OF THE ROAD LAW, AND HINTS FOR ITS AMENDMENT.

To the Editor of the Farmers' Register.

Rockbridge, Dec. 30th, 1834.

I am much pleased to find one of your correspondents in the last Register (No. 7) has taken up the subject of our defective *road law*, and is determined in future numbers to point out the evils arising therefrom. And what place more fit for the discussion of this question, than in a work devoted to the interests of agriculture? For without roads to convey the products of our farms to market, sufficiently good to prevent the freight overrunning the profits, there would be an end to all incitement to enlarge our crops. It is indeed wonderful that a law so vitally important to the best interests of the state, should so long have been suffered to disgrace our statute book, without almost any effort on the part of the legislature to alter or amend it, until the last winter, and then not until the heel of the session, when the minds of the members were more occupied with the approaching electioneering canvass, than with legislation. But it is one of the evils of the present political excitement, that our representatives *will not* venture on any innovation on established usage—or *cannot* indeed with safety, for fear it will be seized on by their political opponents as a pretext to eject them from their seats. It is nevertheless true that our legislature is more prone to the discussion of hair-splitting abstractions, than to more practical business legislation; and whilst they are *talking*, other legislatures are *acting*, and outstripping us in every species of public improvement. But those of our legislature of strong talking propensities, might find ample materials to feast their appetites in portraying the inequality—and therefore the injustice, as well as the utter *inefficiency* of our present road system. A little reflection will point out to them the ample room for complaint daily heard by the surveyor of every precinct, where the sturdy yeoman is compelled to perform his task along side the menial slave; whilst the exempted master is indulging in ease and idleness at home; and this it is, that drives much of the bone and sinew of our state from its borders. It may be that this is a mechanic having a son of sixteen, or upwards, annually renting the house to shelter his family, without waggon or horse, and yet in consequence of the present odious features of the law, is obliged to give the public highways the same amount of labor in *propria persona*, as does the owner of two slaves with permanent residence, and perhaps thousands vested in waggons or stages The poor fellow with scarcely the means to buy the

hoe or mattock for himself and son, delves hard on the road all day, whilst his more fortunate neighbor rolls by in his pleasure carriage unconcerned at the unequal privileges granted him by the law. Depend upon it, to retain this useful class of citizens amongst us, and prevent them from emigrating to states where their rights are better guarded, we must make a thorough and radical change in our road system. I hope your correspondent R. N. will not relax his efforts in this cause until he points out the benefits resulting from the more equal and just road law of Pennsylvania and Ohio, and what is not less important, their *much greater efficiency*. I would suggest to the consideration of R. N. the propriety in the first place of the state appointing an engineer who is fully competent, and will firmly discharge his duties, to review, and re-locate where necessary, all the stage routes of the commonwealth, placing them on the surest and best ground, with an eye solely to the benefit of the *public at large*, regardless of the murmurs of a single individual, who will perhaps grumble though benefitted. And to prevent the possibility of doing injustice to such individual, and the heavy damages given by juries, I would make it the duty of the county courts to ascertain the *actual value* of such lands, and pay over to such individual such actual value at so much per acre. Thus it would be impossible as now, for an obstinate selfish person to obstruct a work of great public utility; or to bribe a sheriff (for they are like other men) to summon juries, whose sentiments he is acquainted with, and who he knows will give exorbitant damages; and we must not forget too, the more flaws, and the less satisfactory these verdicts are to the courts, the better for the sheriff, for he is paid $5 (often more than the condemned land is worth) for every jury summoned.

When the roads are thus located by an able and perfectly disinterested engineer, they should be given up to the county courts, whose duty it should be to appoint commissioners for roads, to be paid for their services out of the *road fund* to be raised by a moderate tax for that purpose, and whose duty it would be to apply such funds to the hire of laborers, for opening and keeping in repair the roads—giving to those interested, the option to pay the tax assessed for that purpose, in money, or in work at a fair per diem allowance. But I have already exceeded my limits and must leave the subject to the abler pen of R. N.

R. R. B.

CEDAR HEDGES.

To the Editor of the Farmers' Register.

Cumberland Stony Point Mills,
26th Nov. 1834.

You will confer a singular favor on me, and others who are now present, requesting that I should apply to you for information in relation to live fencing from the cedar, which abounds here in great numbers. At what season should transplanting take place, and how should they be planted—deep or shallow, the size of the bush, &c.?—and when and how the berries should be drilled? It is alleged by a gentleman now present, that they will come up freely after passing through the body of a robin, and that they do not come up from simply placing them under ground. Is this so, or not? Please to write freely and fully to this point.

SAMUEL HOBSON.

[We cannot answer the foregoing inquiries better than by giving the following extract from Taylor's *Arator*, on cedar hedges. Our personal experience on this subject is very limited—but such as it is, its fruits are readily offered. For the purpose of testing the means of overcoming the first difficulty, (that is, the transplanting, without killing or materially injuring the young cedars,) a row of eight or ten yards' length was set out as recommended by Taylor, (except being in a single line.) The trial was made in a foul bushy piece of ground which formed part of a hog lot, and on a compact clay soil. The young cedars stood very thick around, so that they could be transplanted without being moved more than a few yards. A trench was first dug about ten inches deep, and rather wider than the spade. Each plant was dug up in a square mass of soil, of the width of the spade, and from six to ten inches deep, and immediately lifted and placed in the trench. The interstices were afterwards filled with loose earth, and the whole then trodden down so as to be compact. No farther care was used, nor any after-tillage, or protection from the trampling of the live-stock—and yet by the next summer only one of the plants was killed, or apparently injured by the change of place. But this want of care, and the growth of a cedar thicket over the whole space, of course served to thin the plants, and destroy its hedge-like appearance. The trial was only intended to show if the transplanting could be safely effected, and in that respect, it was successful. The plants varied from six to eighteen inches in height. If a distant removal had been necessary, the labor and the risk would have been greatly increased. No attempt was made to apply the plan to use for enclosing fields, because live fences can never succeed in Virginia so long as the law permits hogs to range at large, and debars the owner of a field from all remedy for their depredations. Whenever this objection is removed, the sowing of the cedar seeds will probably be found a cheaper mode than transplanting. It is supposed, that they will not vegetate until after having passed through the body of some animal: but the same end may be reached by using a proper degree of artificial heat. Bordley found the same difficulty with the seeds of hedge thorns, and overcame it, both by mixing them with the food of cattle, and by keeping them in a moderately warm fluid for several days, after which they sprouted well.—See *Bordley's Husbandry*.]

From Taylor's *Arator*.

Live fences.—This subject, so extremely material to a country requiring to be raised from the dead, by vast and repeated doses of the only genuine terrene elixir, testifies in every quarter of the United States, to the scantiness of our agricultural knowledge; and is one of the presages, that it is doomed to live and die an infant. If it is an idiot, its case is hopeless; but if it is only a dunce, it must in time discern the vast saving of labor to be applied to draining and manuring, the vast saving of

wood and timber for fuel and building, and the vast accession to arable, by rendering less woodland necessary, as acquisitions arising from live fences.

In the "Memoirs of the Agricultural Society of Philadelphia," several modes of raising live hedges, suitable for different soils and climates, are stated and explained. Two volumes of these memoirs have been published, containing more valuable information upon the subject of agriculture, than any native book I have seen; and if we have no relish for the wit, learning and experience, with which they abound, but little good can be expected from these ephemeral essays. To say much upon a subject, copiously handled in a book which every farmer ought to have, would insinuate the existence of a general apathy towards the eminent talents which have presided over, and greatly contributed to its composition; to say nothing, would be a neglect of a subject of the utmost importance.

Several plants are mentioned in these memoirs as proper for making live fences, but I shall confine my observations to one, because my knowledge experimentally, does not extend to the others. The cedar is peculiarly fitted for the purpose, throughout a great district of the United States. It throws out boughs near the ground, pliant and capable of being easily woven into any form. They gradually however become stiff. Clipping will make cedar hedges extremely thick. No animal will injure them by browsing. Manured and cultivated, they come rapidly to perfection. The plants are frequently to be found in great abundance without the trouble of raising them. As an ever-green they are preferable to deciduous plants; and they live better than any young trees I have ever tried, planted as follows:

From December to the middle of March, the smallest plants are to be taken up in sod of a square conformable to the size of the spade used, as deep as possible, which sod is to be deposited unbroken in a hole as deep made by a similar spade; the earth coming out of it being used to fill up the crevices between the sod and the hole for its reception. I plant these cedars on the out and inside of a straight fence, on the ridge of a ditch, the plants in each row being two feet apart both in the direction of and across this ridge; but so that the plants on one side of the fence will be opposite to the centre of the vacancies between those on the other. Each row will be one foot from the fence, so that the top of the ridge will be about eight inches higher than the position of the plants. They should be topt at a foot high, and not suffered to gain above three or four inches yearly in height, such boughs excepted as can be worked into the fence at the ground. Of these great use may be made towards thickening the hedge, by bending them to the ground, and covering them well with earth in the middle, leaving them growing to the stem, and their extremities exposed. Thus they invariably take root and fill up gaps. If these hedges are cultivated properly, and the land is strong, they will form an elegant live ever-green fence, in a shorter time than is necessary to raise a thorn fence in England, according to the books.

But will they keep out hogs? I am told by travellers that few or none of the hedges in England will do so. Yet hedges are both the chief agricultural ornament, and most valuable improvement of that well cultivated country. But hogs are not there turned loose by law to assail them. I do however think that a cedar hedge is far more capable of forming a fence against hogs than the thorn, because one, as a tree, will acquire more strength or stubbornness than the other, a shrub, can ever reach; and because the cedar is capable of being worked into a closer texture than the thorn.

Yet the wedge-like snout of the hog, the hardiness of his nature, and the toughness of his hide, certainly exhibit him as a dangerous foe to live fences; and the resources of ringing and yoking to control his powers and his disposition, ought to be adverted to, for the sake of an improvement so momentous.—These will not shock our prejudices nor violate our habits, and are supported by a consideration of weight, far inferior to the importance of hedging; and yet light as it is, of weight sufficient to justify the recommendation. If hedges are not protected against hogs, at least four rows of plants, and a double width of ridge or bank will be necessary; there must be a double sized ditch to furnish this earth; a double portion of land will be occupied by the hedge and ditch; and more than double labor, owing to the inconvenience arising from great breadth, will be always required to keep the hedge in order. Something less than moieties in all these cases will suffice for hedges capable of fencing out every other animal, if the legal rights of hogs are only modified, and besides the narrow hedges will be far more beautiful.

PROFITS OF SILK CULTURE IN FRANCE.

Sixth letter of M. Amans Carrier to M. Bonafous, Director of the Royal Garden of Turin, upon the culture of mulberry-trees in the department of Aveyron.

Translated for the Farmers' Register, from the *Annales de l'Agriculture Francaise.*

Rodez, February 15, 1834.

Sir—Having sold the silk of my last crop at Lyons, I can now fulfil the promises of my letter of the 15th of last July, by giving you the definitive result of my management of 1833, and by showing you the improvements introduced in the filature (or winding) of our cocoons.

A circumstance fortunate for the country has brought near us M. Marchetti, an Italian (political refugee) and skilful *filateur* of silk. This young stranger has given me excellent counsels —all of which I am anxious to make use of whenever it is convenient. It is to him (and I give him many thanks) that I owe a part of the good procedure, which I have adopted this year, and which has been very much appreciated by the connoisseurs of Italy and Lyons.

He has also had the goodness to present me with a complete model, (and on a large scale) of a stove to wind the silk, accompanied with the parts and additions indispensable for the operation. This beautiful work, which would deserve to be placed in a public exposition, has been made entirely by his own hands, and from his memory. Although this apparatus presents the advantages of economizing half of the hand work and two-thirds of the fuel, I have not been able to try it yet, inasmuch as none of the winders whom I have under my direction, have had the courage to undertake a like labor. Without doubt we will make the trial some time hence.

Obliged to return to our old method, I have had two furnaces constructed in better proportions than formerly: the winders watched with more attention; the water has been filtrated; the number of threads have received a new measure more regular than formerly; their size has been better regulated. All this care has given me products infinitely more beautiful than in the preceding years.

The first thing to be done, before you wind the cocoons, is, to stifle the crysalides, to prevent them from cutting through. You know that the means made use of now to kill them is very long, and often dangerous. The use of an oven is not always at the disposal of those who produce silk on a small scale; and, besides, from the want of practice, or of intelligence, they run the risk of burning the cocoons by submitting them to a heat too great, or by leaving the crysalides alive, if the heat is not at the proper degree, which is certainly not easy to determine. Killing them by steam is more used, and at the same time more sure; nevertheless, it has the disadvantage of soaking the cocoons and softening them, so that (after the operation) much heat is required to dry them; and when the weather does not permit exposure to the sun, you must have recourse to a stove. It is also known that this operation (by steam) deprives the silk, particularly the white, of the beautiful lustre so much desired by the manufacturers.

I have used, this time, a stifler, constructed in a manner extremely simple, which is, I believe, altogether new in France. This was established with us, under the design and direction of M. Marchetti. The trial I have made of it has given the most happy results. You can smother ten times more cocoons in one day (at the regular heat of 70 degrees Réaumur) than by the common way, and economize firewood considerably.

I will now show you the account of the sale of my silk of 1833. I shall take care to subtract the expenses, and you may see the clear profit.

29½ kil. white silk at 63 fr. the kil.	1,839f.	60c.
2 11/12 inferior [doublon] silk at 18 fr. the kil. - - - - -	44	95
	1,884	55
Deduction for portage, - -	16	00
	1,868f.	55c.
Value of the different materials coming from the remains of the filature, used at my house, - - -	115	00
Sum realized, - - -	1,983f.	55
For the expense of management, - 171f. 75c.	435	60
For the filature, 263 85		
Sum of the product of last raising,	1,548f.	95

To appreciate the advantages of the cultivation of the mulberry, one must only remember, that this sum 1,548 fr. of profit (after deducting all the expenses) is the product of leaves furnished by trees which have occupied for 8 years on an average, a piece of ground rather less than half a hectare or at most two *sétérées*, a local measure.

Having given you the result of this labor in money, permit me to show you the goodness, and particularly, the beauty of the silks of Aveyron. The two following facts are sufficient.

M. Marchetti sent a sample of my silk to one of his countrymen of Italy: he received from Topombrone this answer:

"I have waited until now to answer your interesting letter of the 11th of September last, that I might have the opinions of all my friends (cultivators of silk) upon the sample. I will say in the first place, that the silk of Rodez yields in nothing to the best silk of the countries in Italy. But what appears still more surprising, that Rodez obtains a pound of silk from a much less quantity of cocoons. We may conclude that the climate of that country is excellent for mulberry trees, since the leaves are juicy at the proper season, and the management is excellent there."

M. Bonnaves, merchant at Rodez, has had the goodness to trouble himself with presenting and selling at the market of Lyons the silk which I have obtained; to accomplish this task better, he has concerted with M. Benezech, also our countryman, and silk merchant in this last city. These two friends were desired to examine before the sale, the good and bad qualities of this product of Aveyron with the greatest severity.

The verbal report of M. Bonnaves and the letter of M. Benezech, which confirms it, will show to what class the silks of this department belong, when they are obtained every where with the care which is pointed out to us.

I copy this letter:

"*Lyons*, 1*st Feb.*, 1834.

"M. Amans Carrier—After your letter of the 22d of last month, I was very anxious, at your request, to show your produce in silk to very experienced connoisseurs, who have not hesitated to do justice to the care which you have bestowed on your filature this year. White silk is the most sought after, and yours is of a perfect white; it wants neither pliantness or strength.

Take care to advise the silk raisers of the country not to allow the water to be too warm (for in that case the lustre of the silk is injured) to cleanse the large bunches, not to leave double cocoons, and to recommend to the winders when one cocoon is wound to put in another, so that the thread may always be the same size. The number of 4, 5, or 6 cocoons suit better than 8. If your share had been wound from 4 cocoons, it would have sold much higher.

Have the goodness to make these observations to your friends of Rodez, who have great need to pay attention to them in their products. All this negligence has caused their little shares of silk to sell at only 58 fr. the kil. while yours sold at 63 fr.

Mr. Bonnaves will put into your hands for your part 1,868 fr. 55 c."

The result of all these facts appear to me very proper to enlighten the most obstinate minds, and above all, to encourage those who recoil at the difficulty of the management, and the trouble of the filature. If they did me the honor to consult me on this subject, I would reply that there is no species of industry which is employed with as much readiness as this, in all possible divisions, and which leaves to each separate part a considerable profit, having regard both to the employment of capital and to the labor which is required. I would take for example my management of this year and I would say to them, as follows:

The proprietor who wishes to occupy a plantation of mulberry trees, supposing he had already at his disposal a quantity equal to those which I stripped last spring and in the same condition, (that is) producing 160 quintals of leaves at 4 fr. the quintal. Well! this proprietor could have obtained from half a hectare of ground with no other expense than that of cultivating the trees, a revenue of 640 fr. or 320 fr. for each *sétérée*, composed of 640 square fathoms.

The person who would have bought this quantity of leaves to devote himself only to the raising of silkworms, would have had (as I did) 928 pounds of cocoons, and would have sold them at 1 fr. 50 c. a pound, according to the course of that time: this sale would have produced, - - - - - - 1,392fr. 00c.

Deduction of expenses, purchase of about 8 ounces of eggs at 3 fr. - - - 24fr. 00c.		
Expense of all kind for the management, - - 171 75	895	75
Price of 160 quintals of leaves at 4 fr. - - - 640 00		
Rent of the room, - 60 00		
His part of the profits for 40 days attendance, - - - - -	496	25
The filateur who buys the cocoons obtains a quantity of silk equal to mine and sells it in the same manner, - - - - - -	1,868fr.	55c.
He draws from the remains, -	115	00
Total, - - -	1,983	55
It is necessary to deduct from this sum as the cost of 928 pounds of cocoons at 1 fr. 50 c. - 1,392fr. 00c.		
Expenses of the filature, 263 85	1,655	85
Clear gain of the winder, - -	327	70

The laborer, with a family, takes for his share the remains of this filature, employs his wife and children to prepare and wind the low and different qualities of silk, which are in much request and readily sold. These products can be valued, after having received all the suitable work, 165fr. 00c.

Deduction for the purchase of the first materials, - 50fr. 00c.	80	00
Hand work, although gained by the family, - - 30 00.		
Profit, without including his work already paid, - - - -	85	00

A simple recapitulation will make the result better understood than this division of the labor, which division certainly agrees, in many cases, with the taste or situation of persons who neither wish, nor are able, to undertake all parts of the business.

The land owner who sells 160 quintals of leaves at 4 fr. receives,	640fr.	00c.
The person who buys them and manages the raising, gains, - -	496	25
The winder who takes charge of the cocoons, winds them, and receives for his labor, - - - -	337	70
The laborer who works up the remains does the labor for 30 fr. and gains besides, - - - - - -	85	00
Sum equal to the total profit which I have made by the union of all these operations, - - - - -	1,548	95

The calculations which I have just presented, speak loudly enough without my adding the least observation to make the evidence more sure; I will only say that one of the great benefits of this direction of industry is to make a considerable mass of work for all classes of society, and for all ages. Here is good St. Simonism, which it is necessary to encourage, and in favor of which I should like to see apostles and preachers rise.

I arrive at the object of the letter which you did me the honor to address to me on the 31st of last month, and which informs me that the Royal and Central Society of Agriculture, of Paris, wishing to profit by your presence in this capital, has charged you to present to it a report on the condition of the industry of silks in the parts of France, where it has been recently introduced. You desire, sir, that I should show you our progress, for the purpose of classing in your work the department of Aveyron in the rank which belongs to it. To satisfy this request, I hasten to profit by the documents which are at my disposal, and in uniting them, I dare hope that you will find there all the desired elements.

I will at first acquaint you with a speculation made at Milan in 1833, on a part remarkable enough for cocoons, in the end to try to introduce the filature of silk on a large scale in this city.

This operation has been made on the account of M. M. Brouillet, & Co., and directed by a skilful lady originally from the Cevennes.

The *atelier* of this filature has had, for nearly three months from 7 to 8 *tours en roulement*, giving different qualities of silk, according to the goodness and the color of the cocoons.

Here is the account, truly certified, which has been communicated to me by this house.

The general produce of the filature has been as follows:

$235\frac{30}{100}$ kil. of silk of various qualities, sold at different prices, according to the times, for the sum of	13,300fr.	00c.
Advances to deduct, $3,091\frac{85}{100}$ kil. cocoons bought at the mean price of 3 fr. 30 c. the kil., - 10,239fr. 75c.		
Expense of the filature, 1,725 00	11,964	75
Clear gain for the undertaking,	1,335	25

An experiment crowned with such success will be a powerful encouragement for the future.

The following account will determine you on the progress of the culture of the mulberry in Aveyron. This estimate cannot be of the most rigorous accuracy, but it approaches truth as nearly as possible, because it is the result of conscientious instructions which have come to me from all parts of the department.

Of the 5 *arrondissemens* of which it (Aveyron) is composed, 4 have taken a part more or less in the progress of the mulberry plantations. That

of Villefranche ought to be noted as entirely foreign to this new industrious and agricultural conquest. This neglect is much more to be regretted, as this locality offers (as do all the others) the most favorable positions for the growth. If M. Dupin made the statistics of the plantations of mulberry trees, he would mark, and correctly, the entire perfecture of Villefranche with his blackest ink.

General table of the plantation of mulberry trees and of the management of silk-worms, in the department of Aveyron, in 1833.

Mulberry trees of large size, (*a haute tige*) planted.		Total.	Dwarf mulberry trees.	In nurseries.	No. of the cocoons of the raising of 1833.
before 1819.	from 1819 to 1833.				
					kilog.
9,350	26,260	35,000	6,000	67,000	10,000

I hope that these statements may be agreeable to you, and show the high estimation which I attach to the extending of an industry upon which you have spread so much light. I would also desire much that my countrymen, so often admonished, may be willing to decide on profiting by your advice and instructions. They know that the mulberry tree grows very well in our department; that they have resisted two trials the most severe that a tree could bear; I speak of the 17 or 18 degrees of cold during the winters of 1829 and 1830, and the extreme heat and long drought of the summer of 1831. At both of these periods, so different, and so extreme, the chestnut trees, the walnuts, the oaks, and many other indigenous trees sustained with us very great damages. They know, by the accounts which have been given, and many by their own experience, that the rearing of worms have succeeded beyond their hopes, when they have been well conducted. They know (and I give new proofs of it now) that our country has produced for a long time silks of the best quality. They also know that the sale of this merchandize is certain, prompt, and advantageous. In short, they know all that is necessary to be known for this new industry, with the best established confidence. Well! if there are some undecided or timid minds among the Aveyronese who wish to wait for better or more positive results, I have faith enough in the good judgement, and I know too much of the intelligence of the greater part among them, to fear that the number is large: and although I am tolerably far advanced in the career of my life, I dare hope that I may be permitted to see one day, that my efforts have not been completely foreign to the prosperity of my country.

AMANS CARRIER.

From the Genesee Farmer.

WILLOWS AND GRAPE VINES FOR HEDGES.

Mr. L. Tucker—Although I have not been a strenuous advocate for hedges as fence, believing they were generally harbors for weeds, and took too much ground, yet there are circumstances which render them very proper. Many years ago a friend of mine had about ten acres of swamp land, so miry that he could not make a good fence; on this swamp he planted a double row of yellow willow cuttings nine inches apart, making the rows break joints—these, in about three years, had grown from twelve to sixteen feet high—they were then lopped about six feet from the ground and the tops brought down. After this a row of blue grape vine cuttings was planted one every three feet, along the willows—these in a few years climbed the trees, and have yielded a plentiful crop of grape juice, which has been sold to the distilleries, and furnished a good income; so that the proprietor has not only a good fence but a fruitful one. This land was divided by small narrow ditches, nine inches wide and six deep, every four rods—then between these ditches, when the ground was frozen, he carted on a quantity of pit sand, by which means the water was thrown each way to these narrow ditches, and the land sown with red top grass, and has for more than twenty years yielded a plentiful crop of hay annually. This land, since my remembrance, was considered worthless, but now yields an income of more than two hundred dollars per annum.

R. M. WILLIAMS.

Potter, Nov. 29, 1834.

From the Library of Useful Knowledge—Farmer's Series.

GENERAL HISTORY OF THE HORSE.

The native country of the horse cannot with certainty be traced. He has been found, varying materially in size, in form, and in utility, in all the temperate, in most of the sultry, and in many of the northern regions of the Old World.

In the sacred volume, which, beside its higher claims to stand at the head of the Farmer's Library, contains the oldest authentic record of past transactions, we are told that, so early as 1650 years before the birth of Christ, the horse had been domesticated by the Egyptians. When Joseph carried his father's remains from Egypt to Canaan, "there went up with him both chariots and horsemen."* One hundred and fifty years afterwards, the horse constituted the principal strength of the Egyptian army. Pharoh pursued the Israelites with "six hundred chosen chariots, and with all the chariots of Egypt."†

If we could believe the accounts of the uninspired historians, Sesostris (the monarch probably whom Joseph served) had twenty-seven thousand chariots of war; and Semiramis, the founder of Babylon, had one hundred thousand chariots, and a million of horsemen; but this was probably a great exaggeration.

Fifty years after the expulsion of the Israelites from Egypt, and 1450 years before the birth of Christ, the horse was so far naturalized in Greece that the Olympic games were instituted, including chariot and horse races. We have, therefore, sufficient evidence that the horse was at a very early period, subjected to the dominion of man, and, unfortunately, for the worst of purposes—the business of war.

From the records of the Old Testament, we are likewise enabled to ascertain the precise period of time, when in Egypt and Canaan, and the neighboring countries, this animal began to be domesti-

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* Gen. i. 9. † Exod. xvi. 7.

cated. 1920 years before the birth of Christ, when Abraham, having left Harar, in obedience, to the divine command, was driven into Egypt by the famine which raged in Canaan,* Pharoh offered him sheep and oxen, and asses and camels. Horses would doubtless have been added, had they then existed, or had they been subdued in Egypt.

When, fifty years afterwards, Abraham journeyed to Mount Moriah, to offer up his only son, he rode upon an ass, which, with all his wealth and power, he would scarcely have done, had the horse been known.†

Thirty years later, when Jacob returned to Isaac with Rachel and Leah, an account is given‡ of the number of oxen, sheep, camels, goats, and asses, which he sent to appease the anger of Esau, but not one horse is mentioned.

It is not until twenty-four years after this, when the famine devastated Canaan,‖ and Jacob sent into Egypt to buy corn, that horses are first heard of. "Waggons," probably carriages drawn by *horses*, were sent by Joseph into Canaan to bring his father to Egypt. It would seem, however, that horses had been but lately introduced, and were not numerous, or not used as beasts of burden; for the whole of the corn, which was to be conveyed some hundred miles, and was to afford subsistence for Jacob's large household, was carried on asses.

It appears, then, that about 1740 years before Christ, horses were first used in Egypt; but they soon afterwards became so numerous as to form a considerable proportion of the Egyptian army: and when the Israelites returned into Canaan, the horse had been introduced and naturalized there; for the Canaanites "went out to fight against Israel with horses and chariots very many."§

The sacred volume, therefore, clears up a point upon which no other record throws any light—namely, the period when the horse first became the servant of man, at least in one part of the world, and that the most advanced in civilization, and before Greece was peopled. A long time must have elapsed before man was able to ascertain the value and peculiar use of the animals that surrounded him. He would begin with the more subordinate—those which were most easily caught, and most readily subdued; and the benefits which he derived from their labors would induce him to attempt the conqest of superior quadrupeds. In accordance with this, the writings of Moses shew us that, after the ox, the sheep, and the goat, man subdued the ass, and then the camel, and, last of all, the horse became his servant: and no sooner was *he* subdued, and his strength and docility and sagacity appreciated, than the others were comparatively disregarded, except in Palestine, where the use of the horse was forbidden by divine authority, and on extensive and barren deserts, where he could not live.¶

From Egypt the use of the horse was propagated to other and distant lands; and, probably, the horse himself was first transmitted from Egypt to several countries. The Greeks affirm, that Neptune struck the earth with his trident, and a horse appeared. The truth is, that the Thessalians, the first and most expert of the Grecian horsemen, and likewise the inhabitants of Argos and of Athens, were colonists from Egypt.

The Bible likewise decides another point, that Arabia, by whose breed of horses those of other countries have been so much improved, was not the native place of the horse. Six hundred years after the time just referred to, Arabia had no horses. Solomon imported spices, gold, and silver, from Arabia;* but all the horses for his own cavalry and chariots, and those with which he supplied the Phœnician monarchs, he procured from Egypt.†

In the seventh century after Christ, when Mahomet attacked the Koreish near Mecca, he had but two horses in his whole army; and at the close of his murderous campaign, although he drove off twenty-four thousand camels, and forty thousand sheep, and carried away twenty-four thousand ounces of silver, not one horse appears in the list of plunder.

There is a curious record of the commerce of different countries at the close of the second century. Among the articles exported from Egypt to Arabia, and particularly as presents to reigning monarchs, were horses.

In the fourth century two hundred Cappadocian horses were sent by the Roman emperor, as the most acceptable present he could offer a powerful prince of Arabia.

So late as the seventh century, the Arabs had few horses, and those of little value. These circumstances sufficiently prove that, however superior may be the present breed, it is comparatively lately that the horse was naturalized in Arabia.

The horses of Arabia itself, and of the south-eastern parts of Europe, are clearly derived from Egypt; but whether they were there bred, or imported from the south-western regions of Asia, or, as is more probable, brought from the interior, or northern coast of Africa, cannot with certainty be determined.

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*Gen. xii. 16. †Gen. xxii. 3. ‡Gen. xxxii. 14.

‖Gen. xlv. 19. §Joshua xi. 4.

¶When Sir Gore Ouseley travelled through Persia, and the different countries of the east, he examined, among other relics of antiquity, the sculptures on the ruins of Persepolis, and he draws from them a curious and interesting conclusion as to the *manner* in which the horse was gradually subdued. "There are no figures," says he, "mounted on horseback, although some travellers have mentioned horsemen among those sculptures. One would think that the simple act of mounting on a horse's back would naturally have preceded the use of wheel-carriages and their complicated harness; yet no horsemen are found at Persepolis; and we know Homer's horses are represented in chariots from which the warriors sometimes descended to combat on foot, but the poet has not described them as fighting on horseback. The absence of mounted figures might authorize an opinion that those sculptures had been executed before the time of Cyrus, whose precepts and example first inspired the Persians with a love of equestrian exercises, of which, before his time, they were wholly ignorant."—vol. ii. p. 276.

* 2 Chron. ix. 14.

†The historian gives us the price of the horse and the chariot at that time. A horse brought from Egypt including, probably, the expense of the journey, cost one hundred and fifty shekels of silver, which, at two shillings, three pence, and one half farthing, each, amounts to about seventeen pounds two shillings. A chariot cost six hundred shekels, or sixty-eight pounds, eight shillings; a most enormous sum at that early period, but little to him who expended more than thirty-five millions of pounds, in gold alone, to ornament the Temple which he had built. † 2 Chron. i. 17.

THE DIFFERENT FOREIGN BREEDS OF HORSES.

The Wild Horse.

Troops of wild horses are found in the plains of Great Tartary, and also in several parts of South America. In neither, however, can we recognise an original race. The horses of the Ukraine, and those of South America, are equally the descendants of those who had escaped from the slavery of man. The Tartar horses are fleet and strong, but comparatively of an ordinary breed. Those of South America retain, almost unimpaired, the size and form of their European ancestors.

In no part of America, or of the more newly-discovered islands of the Pacific, was the horse known until he was introduced by Europeans; and the origin of the horses of Tartary has been clearly traced to those who were employed in the siege of Azoph, in 1657, but which were turned loose for want of forage.

All travellers, who have crossed the plains extending from the shores of La Plata to Patagonia, have spoken of numerous droves of wild horses. Some affirm that they have seen ten thousand in one troop. They appear to be under the command of a leader, the strongest and boldest of the herd, and whom they implicitly obey. A secret instinct teaches them that their safety consists in their union, and in a principle of subordination. The lion, the tiger, and the leopard,* are their principal enemies. At some signal, intelligible to them all, they either close into a dense mass, and trample their enemy to death; or, placing the mares and foals in the centre, they form themselves into a circle and welcome him with their heels. In the attack, their leader is the first to face the danger, and, when prudence demands a retreat, they follow his rapid flight.

In the thinly inhabited parts of South America it is dangerous to fall in with any of these troops. The wild horses approach as near as they dare: they call to the loaded horse with the greatest eagerness, and, if the rider be not on the alert, and have not considerable strength of arm, and sharpness of spur, his beast will divest himself of his burden, take to his heels, and be gone forever.

Captain Head gives the following account of a meeting with a troop of wild horses, where the country is more thickly inhabited. Some poor captured animals are supposed to be forced along by their riders at their very utmost speed:—"As they are thus galloping along, urged by the spur, it is interesting to see the groups of wild horses one passes. The mares, which are never ridden in South America, seem not to understand what makes the poor horse carry his head so low, and look so weary.† The little innocent colts come running to meet him, and then start away frightened: while the old horses, whose white marks on the flanks and backs betray their acquaintance with the spur and saddle, walk slowly away for some distance, then, breaking into a trot as they seek their safety, snort and look behind them, first with one eye and then with the other, turning their nose from right to left, and carrying their long tail high in the air."*

The same pleasing writer describes the system of horse-management among the rude inhabitants of the plains of South America. They have no stables, no fenced pastures. One horse is usually kept tied at the door of the hut, fed scantily at night on maize; or at other times several may be enclosed in the *corral*, which is a circular space surrounded by rough posts, driven firmly into the ground. The mares are never ridden, or attempted to be tamed, but wander with their foals wherever they please.

When the *Gaucho*, the native inhabitant of the plains, wants horses for himself or for the supply of the traveller, he either goes with his *lasso* to the *corral*, and selects those, possibly, who on the preceding day had for the first time been backed, or he scampers across the plain, and presently returns with an unwilling, struggling, or subdued captive. When the services of the animals have been exacted, he either takes them to the *corral*, and feeds them with a small quantity of maize, if he thinks he shall presently need them again, or he once more turns them loose on the plains.

Travellers give some amusing accounts of the manner in which all this is effected—Miers† thus describes the *lasso*, simple in its construction, but all-powerful in the hands of the Gaucho.

"The *Lasso* is a missile weapon used by every native of the United Provinces and Chile. It is a very strong plaited thong of equal thickness, half an inch in diameter, and forty feet long; made of many strips of green hide, plaited like a whip-thong, and rendered supple by grease. It has, at one end, an iron ring above an inch and a half in diameter, through which the thong is passed, and this forms a running noose. The Gaucho, or native Peon, is generally mounted on horseback when he uses the lasso. One end of the thong is affixed to his saddle girth: the remainder he coils carefully in his left hand, leaving about twelve feet belonging to the noose-end, in a coil, and a half of which he holds in his right hand. He then swings this long noose horizontally round his head, the weight of the iron ring at the end of the noose assisting in giving to it, by a continued circular motion, a sufficient force to project it the whole length of the line."

When the Gauchos wish to have a grand breaking-in, they drive a whole herd of wild horses into the corral. "The corral was quite full of horses, most of which were young ones about two or three years old. The *capitar* (chief Gaucho,) mounted on a strong steady horse, rode into the corral and threw his lasso over the neck of a young horse, and dragged him to the gate. For some time he was very unwilling to leave his comrades; but the moment he was forced out of the corral, his first idea was to gallop away: however, a timely jerk of the lasso checked him in the most effectual way. The Peons now ran after him on foot and threw a lasso over his fore-legs just above the fetlock, and twitching it, they pulled his legs from under him so suddenly, that I really thought the

*These animals are of a different race from those which go under the same names in the Old World, and are very inferior in strength.

†An Englishman once attempted to ride a mare, but he was hooted and pelted by the natives, and thought himself fortunate to escape without serious injury.

Sir John Carr, in his Northern Summer, p. 44, states that it is only a short time since mares began to be ridden in Russia.

*Head's Journey across the Pampas, p. 258.

†Miers' Travels in Chile, vol. i. p. 88.

fall he got had killed him. In an instant a Gaucho was seated on his head, and with his long knife, and in a few seconds, cut off the whole of the horse's mane, while another cut the hair from the end of his tail. This they told me was a mark that the horse had been once mounted. They then put a piece of hide into his mouth to serve for a bit, and a strong hide halter on his head. The Gaucho who was to mount, arranged his spurs, which were unusually long and sharp,* and while two men held the horse by his ears, he put on the saddle, which he girthed extremely tight. He then caught hold of the horse's ear, and in an instant vaulted into the saddle; upon which, the man who held the horse by the halter threw the end to the rider, and from that moment no one seemed to take any further notice of him.

"The horse instantly began to jump in a manner which made it very difficult for the rider to keep his seat, and quite different from the kick or plunge of an English horse: however, the Gaucho's spurs soon set him going, and off he gallopped, doing every thing in his power to throw his rider.

"Another horse was immediately brought from the corral, and so quick was the operation, that twelve Gauchos were mounted in a space which I think hardly exceeded an hour. It was wonderful to see the different manner in which different horses behaved. Some would actually scream while the Gauchos were girding the saddle upon their backs; some would instantly lie down and roll upon it; while some would stand without being held—their legs stiff, and in unnatural positions, their necks half bent towards their tails, and looking vicious and obstinate; and I could not help thinking that I would not have mounted one of those for any reward that could be offered me, for they were invariably the most difficult to subdue.

"It was now curious to look around and see the Gauchos on the horizon in different directions, trying to bring their horses back to the corral, which is the most difficult part of their work; for the poor creatures had been so scared there that they were unwilling to return to the place. It was amusing to see the antics of the horses—they were jumping and dancing in different ways, while the right arm of the Gauchos was seen flogging them. At last they brought the horses back, apparently subdued, and broken in. The saddles and bridles were taken off, and the young horses trotted off towards the corral, neighing to one another."†

When the Gaucho wishes to take a wild horse, he mounts one that has been used to the sport, and gallops over the plain. As soon as he comes sufficiently near his prey, "the lasso is thrown round the two hind legs, and as the Gaucho rides a little on one side, the jerk pulls the entangled horse's feet laterally, so as to throw him on his side, without endangering his knees or his face. Before the horse can recover the shock, the rider dismounts, and snatching his *poncho* or cloak from his shoulders, wraps it round the prostrate animal's head. He then forces into his mouth one of the powerful bridles of the country, straps a saddle on his back, and bestriding him, removes the poncho; upon which the astonished horse springs on his legs, and endeavers by a thousand vain efforts to disencumber himself of his new master, who sits quite composedly on his back, and, by a discipline which never fails, reduces the horse to such complete obedience, that he is soon trained to lend his whole speed and strength to the capture of his companions."*

These animals possess much of the form of the Spanish horse, from which they sprung; they are tamed, as has been seen, with far less difficulty than could be thought possible; and, although theirs is the obedience of fear, and enforced at first by the whip and spur, there are no horses who so soon and so perfectly exert their sagacity and their power in the service of man. They are possessed of no extraordinary speed, but they are capable of enduring immense fatigue. They are frequently ridden sixty or seventy miles without drawing bit, and have been urged on by the cruel spur of the Gaucho, more than a hundred miles, and at the rate of twelve miles in the hour.

Like the Arab horses, they know no intermediate pace between the walk and the gallop. Although at the end of a day so hard, their sides are horribly mangled, and they completely exhausted, there is this consolation for them—they are immediately turned loose on the plains, and it will be their own fault if they are speedily caught again. The mare is occasionally killed for food, and especially on occasions of unusual festivity. General San Martin, during the war for independence, gave a feast to the Indian allies attached to his army; and mares' flesh, and the blood mixed with gin, formed the whole of the entertainment.

On such dry and sultry plains the supply of water is often scanty, and then a species of madness seizes on the horses, and their generous and docile qualities are no longer recognized. They rush violently into every pond and lake, savagely mangling and trampling upon one another; and the carcases of many thousands of them, destroyed by their fellows, have occasionally been seen in and around a considerable pool. This is one of the means by which the too rapid increase of this quadruped is, by the ordinance of Nature, there prevented.

The wild horses of Tartary, although easily domesticated, materially differ in character from those on the plains of South America. They will not suffer a stranger to join them. If a domesticated horse comes in their way, unprotected by his master, they attack him with their teeth and their

*The manufacture of the Gaucho's boots is somewhat singular. "The boots of the Gauchos are formed of the ham and part of the leg-skin of a colt taken reeking from the mother, which is said to be sacrificed for the sole purpose, just at the time of bearing when the hair has not begun to grow. At this stage, the skin strips off easily, and is very white and beautiful in texture and appearance. The ham forms the calf of the boot; the hock easily adapts itself to the heel, and the leg above the fetlock constitutes the foot: the whole making a neat and elegant half-boot, with an aperture sufficient for the great toe to project through." —Andrews's Journey in South America, vol. i. p. 26.

†Head's Journey across the Pampas, p. 258.

*Basil Hall's Journey to Peru and Mexico, vol. i. p. 151. The Jesuit Dobrizhoffer, in his History of the Abipones, a nation of Paraguay, and speaking of the tamed horse, (vol. ii. p. 113,) says, that "stirrups are not in general use. The men leap on their horse on the *right* side. In the right hand they grasp the bridle, and in the left a very long spear, leaning on which, they jump with the impulse of both feet, and then fall right upon the horse's back."

heels, and speedily destroy him. They readily submit, however, to the dominion of man, and become perfectly docile and faithful.

Among the Tartars, the flesh of the horse is a frequent article of food; and although they do not, like the Indians of the Pampas, eat it raw, their mode of cookery would not be very inviting to the European epicure. They cut the muscular parts into slices, and place them under their saddles, and after they have gallopped thirty or forty miles, the meat becomes tender and sodden, and fit for their table; and, at all their feasts, the first and last and most favorite dish, is a horse's head.

When water was not at hand, the Scythians used to draw blood from their horses, and drink it; and the dukes of Muscovy, for nearly two hundred and sixty years, presented Tartar ambassadors with the milk of mares. If any of this milk fell upon the mane of the horse, the duke by custom, was bound to lick it off.

Troops of wild horses are occasionally met with in the central parts of Africa, in the island of St. Domingo, on the deserts of Arabia, and in a few other parts of the world; but no where do they equal the domesticated horse in form, strength, or even speed.

The Barb.

It has been already stated, that the earliest records we have of the horse, trace him to Egypt, whence he gradually found his way to Arabia and Persia, and the provinces which were colonized from Egypt; and thence to the other parts of the Old World. But Egypt is not now a breeding country, and it does not appear to possess those requisites which could ever have constituted it one. Without, however, entering into the question whether the horse was primarily the inhabitant of some particular region, whence other parts were gradually supplied, or whether it was common to many countries, but differing in each; we have stated it to be probable that the horses of Egypt, the earliest on record, were derived from the neighboring and interior districts of Africa. Therefore, in giving a very summary account of the most celebrated and useful breeds of different countries, it is natural to begin with those of Africa.

At the head of these is the *Barb*, from Barbary, and particularly from Morocco and Fez, and the interior of Tripoli; and remarkable for his fine and graceful action. It is rather lower than the Arabian, seldom exceeding fourteen hands and an inch. The shoulders are flat, the chest round, the joints inclined to be long, and the head particularly beautiful. The Barb is decidedly superior to the Arab in form, but has not his spirit, or speed, or countenance.

The Barb has chiefly contributed to the excellence of the Spanish horse; and, when the improvement of the breed of horses began to be systematically pursued in Great Britain, the Barb was very early introduced. The Godolphin Arabian, as he is called, and who was the origin of some of our best racing blood, was a Barb; and others of our most celebrated turf-horses trace their descent from African mares.

More in the centre of Africa, in the kingdom of Bournou, is a breed, which Mr. Tully, in his almost romantic history of Tripoli, reckons superior even to those of Arabia or Barbary; it possesses the best qualities of both those breeds, being as serviceable as that of Arabia, and as beautiful as that of Barbary.

In the more southern and western districts of Africa, and particularly in the neighborhood of the Guinea Coast, the breed of horses is very inferior. They are small, weak, unsafe, and untractable. But neither horses nor any other produce of value, can be looked for in those unhappy countries, so long as they are desolated by the infernal slave-trade inflicted upon them by the most civilized, but truly unchristian, nations of Europe.

The Dongola Horse.

The kingdom of Dongola, and the neighboring districts lying between Egypt and Abyssinia, contain a horse not at all like any other oriental.

The "Dongola horses stand full sixteen hands high, but the length of the body, from the shoulders to the quarter, is considerably less. Their form, therefore, is opposite to that of the Arabian, or English thorough-bred, which are longer by some inches than they are high. The neck is long and slender, the crest fine, and the withers sharp and high, giving a beautiful forehand; but the breast is too narrow, the quarters and flanks too flat, and the back *carped*. They constitute excellent war-horses, from their speed, durability, and size. Several of them have lately been imported into Europe, but they are little valued. Possibly, with three-part-bred mares, they might improve our cavalry horses."

Bosman, whose descriptions prove him to be no bad horseman, thus speaks of them, but in somewhat too flattering a manner. "The Dongola horses are the most perfect in the world, being beautiful, symmetrical in their parts, nervous and elastic in their movements, and docile and affectionate in their manners. One of these horses was sold in 1816, at Grand Cario, for a sum equivalent to 1000*l*."

Mr. Bruce tells us, that the best African horses are said to be descended from one of the five on which Mahomet and his four immediate successors fled from Mecca to Medina, on the night of the Hegira. He thus accounts for very singular and opposite customs among the Arabs and Africans.

"No Arab ever mounts a stallion: on the contrary, in Africa they never ride mares. The reason is plain. The Arabs are constantly at war with their neighbors, and always endeavor to take their enemies by surprise in the grey of the evening, or the dawn of day. A stallion no sooner smells the stale of the mare in the enemy's quarters, than he begins to neigh, and that would give the alarm to the party intended to be surprised. No such thing can ever happen when they ride mares only. On the contrary, the Funge trust only to superior force. They are in an open, plain country—must be discovered at many miles distance—and all such surprises and stratagems are useless to them."

The Arabian.

Going further eastward we arrive at Arabia, whose horses deservedly occupy the very highest rank.

A few wild horses are yet seen on some of the deserts of Arabia. They are hunted by Bedouins for their flesh, which is considered a delicacy,

if the animal be young; and also to increase their stock of inferior horses, which they often palm on the merchant as descended from the sacred breed. They are said to be even swifter than the domesticated horse, and are usually taken by traps hidden in the sand. Mr. Bruce, however, doubts whether any wild horses are now found in Arabia Deserta.*

Although in the seventh century the Arabs had no horses of value, yet the Cappadocian and other horses which they had derived from their neighbors, were preserved with so much care, and propagated so uniformly and strictly from the finest of the breed, that in the thirteenth century the Arabian horse began to assume a just and unrivalled celebrity.

There are said to be three breeds or varieties of Arabian horses; the *Attechi*, or inferior breed, on which they set little value, and which are found wild on some parts of the deserts; the *Kadischi*, literally horses of an unknown race, answering to our half-bred horses—a mixed breed; and the *Kochlani*, horses whose genealogy, according to the Arab account, is known for two thousand years. Many of them have written and attested pedigrees extending more than four hundred years, and, with true Eastern exaggeration, traced by oral tradition from the stud of Solomon. A more careful account is kept of these genealogies than belongs to the most ancient family of the proudest Arab chief, and very singular precautions are taken to prevent the possibility of fraud, so far as the written pedigree extends.

The *Kochlani* are principally reared by the Bedouin Arabs, in the remoter deserts. A stallion may be procured without much difficulty, although at a great price. A mare is rarely to be obtained, except by fraud and excessive bribery. The Arabs have found out that which the English breeder should never forget, that the female is more concerned than the male in the excellence and value of the produce; and the genealogies of their horses are always reckoned from the mothers.

The Arabian horse would not be acknowledged by every judge to possess a perfect form: his head, however, is inimitable. The broadness and squareness of the forehead, the shortness and fineness of the muzzle, the prominence and brilliancy of the eye, the smallness of the ears, and the beautiful course of the veins, will always characterize the head of the Arabian horse.

His body may be considered as too light, and his chest as too narrow; but behind the arms the barrel generally swells out, and leaves sufficient room for the play of the lungs.

In the formation of the shoulder, next to that of the head, the Arab is superior to any other breed. The withers are high, and the shoulder-blade inclined backward, and so nicely adjusted, that in descending a hill the point or edge of the ham never ruffles the skin. He may not be thought sufficiently high; he seldom stands more than fourteen hands two inches.

The fineness of his legs, and the oblique position of his pasterns, may be supposed to lessen his apparent strength; but the leg, although small, is flat and wiry; anatomists know that the bone has no common density, and the starting muscles of the fore-arm and the thigh indicate that he is fully capable of accomplishing many of the feats which are recorded of him.

The Barb alone excels him in noble and spirited action; and if there be defects about him, he is perfect for that for which he was designed. He presents the true combination of speed and bottom —strength enough to carry more than a light weight, and courage that would cause him to die rather than to give up.

We may not, perhaps, believe all that is told us of the Arabian. It has been remarked, that there are on the deserts which this horse traverses, no mile-stones to mark the distance, or watches to calculate the time; and the Bedouin is naturally given to exaggeration, and, most of all, when relating the prowess of the animal, which he loves as dearly as his children; yet it cannot be denied that, at the introduction of the Arabian into the European stables, there was no other horse comparable to him.

The Arab horse is as celebrated for his docility and good temper as for his speed and courage. In that delightful book, 'Bishop Heber's Narrative of a Journey through the Upper Provinces of India,' the following interesting character is given of him. "My morning rides are very pleasant. My horse is a nice, quiet, good-tempered little Arab, who is so fearless, that he goes without starting close to an elephant, and so gentle and docile that he eats bread out of my hand, and has almost as much attachment and coaxing ways as a dog. This seems the general character of the Arab horses, to judge from what I have seen in this country. It is not the fiery dashing animal I had supposed, but with more rationality about him, and more apparent confidence in his rider, than the majority of English horses."

The kindness with which he is treated from a foal, gives him an affection for his master, a wish to please, a pride in exerting every energy in obedience to his commands, and, consequently, an apparent sagacity which is seldom seen in other breeds. The mare and her foal inhabit the same tent with the Bedouin and his children. The neck of the mare is often the pillow of the rider, and, more frequently, of the children, who are rolling about upon her and the foal: yet no accident ever occurs, and the animal acquires that friendship and love for man which occasional ill-treatment will not cause him for a moment to forget.

When the Arab falls from his mare, and is unable to rise, she will immediately stand still and neigh until assistance arrives. If he lies down to sleep, as fatigue sometimes compels him, in the midst of the desert, she stands watchful over him, and neighs and rouses him if either man or beast approaches. An old Arab had a valuable mare that had carried him for fifteen years in many a hard-fought battle, and many a rapid weary march; at length, eighty years old, and unable longer to ride her, he gave her, and a scimitar that had been his father's, to his eldest son, and told him to appreciate their value, and never lie down to rest until he had rubbed them both as bright as a looking-glass. In the first skirmish in which the young man was engaged he was killed, and the mare fell into the hands of the enemy. When the news reached the old man, he exclaimed that "life was no longer worth preserving, for he had lost both his son and his mare, and he grieved for

*Bruce's Travels, vol. vi. p. 430.

one as much as the other;" and he immediately sickened and died.*

Man, however, is an inconsistent being. The Arab who thus lives with and loves his horses, regarding them as his most valuable treasure, sometimes treats them with a cruelty scarcely to be believed, and not at all to be justified. The severest treatment which the English race-horse endures is gentleness compared with the trial of the young Arabian. Probably the filly has never before been mounted; she is led out; her owner springs on her back, and goads her over the sand and rocks of the desert at full speed for fifty or sixty miles without one moment's respite. She is then forced, steaming and panting, into water deep enough for her to swim. If, immediately after this, she will eat as if nothing had occurred, her character is established, and she is acknowledged to be a genuine descendant of the *Kochlani* breed. The Arab is not conscious of the cruelty which he thus inflicts. It is an invariable custom, and custom will induce us to inflict many a pang on those whom, after all, we love.

The following anecdote of the attachment of an Arab to his mare has often been told, but it comes home to the bosom of every one possessed of common feeling. "The whole stock of an Arab of the desert, consisted of a mare. The French consul offered to purchase her in order to send her to his sovereign, Louis XIV. The Arab would have rejected the proposal at once with indignation and scorn; but he was miserably poor. He had no means of supplying his most urgent wants, or procuring the barest necessaries of life. Still he hesitated; he had scarcely a rag to cover him —and his wife and his children were starving. The sum offered was great—it would provide him and his family with food for life. At length, and reluctantly, he consented. He brought the mare to the dwelling of the consul—he dismounted—he stood leaning upon her; he looked now at the gold, and then at his favorite; he sighed—he wept. 'To whom is it,' said he, 'I am going to yield thee up? To Europeans, who will tie thee close—who will beat thee—who will render thee miserable. Return with me, my beauty, my jewel, and rejoice the hearts of my children.' As he pronounced the last words, he sprung upon her back, and was out of sight in a moment."

The next anecdote is scarcely less touching, and not so well known. Ibrahim, a poor but worthy Arab, unable to pay a sum of money which he owed, was compelled to allow a merchant of Rama to become partner with him in a valuable mare. When the time came, he could not redeem his pledge to this man, and the mare was sold. Her pedigree could be traced on the side of sire and dam for full five hundred years. The price was three hundred pounds; an enormous sum in that country. Ibrahim went frequently to Rama to inquire after the mare: he would embrace her, wipe her eyes with his handkerchief—rub her with his shirt-sleeves, and give her a thousand benedictions during whole hours that he remained talking to her. 'My eyes!' would he say to her, 'my soul! my heart! must I be so unfortunate as to have thee sold to so many masters and not keep thee myself? I am poor, my antelope! I brought thee up in my dwelling as my child. I did never beat nor chide thee; I caressed thee in the proudest manner. God preserve thee, my beloved! thou art beautiful, thou art sweet, thou art lovely! God defend thee from envious eyes!"

Sir John Malcolm gives two anecdotes to the same purpose, but of a more amusing nature.

"When the envoy, returning from his former mission, was encamped near Bagdad, an Arab rode a bright bay mare of extraordinary shape and beauty before his tent, until he attracted his attention. On being asked if he would sell her; 'What will you give me?' was the reply: 'That depends upon her age; I suppose she is past five?' 'Guess again,' said he. 'Four?' 'Look at her mouth,' said the Arab, with a smile. On examination she was found to be rising three. This, from her size and symmetry, greatly enhanced her value. The envoy said, 'I will give you fifty tomans' (a coin nearly of the value of a pound sterling.) 'A little more if you please,' said the fellow, apparently entertained. 'Eighty. A hundred.' He shook his head and smiled. The offer at last came to two hundred tomans! 'Well, said the Arab, 'you need not tempt me further—it is of no use. You are a rich elchee (nobleman.) You have fine horses, camels, and mules, and, I am told, you have loads of silver and gold. Now, added he, 'you want my mare, but you shall not have her for all you have got,"*

"An Arab sheick or chief, who lived within fifty miles of Bussorah, had a favorite breed of horses. He lost one of his best mares, and could not for a long while discover whether she was stolen or had strayed. Some time after, a young man of a different tribe, who had long wished to marry his daughter, but had always been rejected by the sheick, obtained the lady's consent and eloped with her. The sheick and his followers pursued, but the lover and his mistress, mounted on one horse, made a wonderful march, and escaped. The old chief swore that the fellow was either mounted upon the devil, or the favorite mare he had lost. After his return, he found the latter was the case; that the lover was the thief of his mare as well as his daughter; and that he stole the one to carry off the other. The chief was quite gratified to think he had not been beaten by a mare of another breed; and was easily reconciled to the young man, in order that he might recover the mare, which appeared an object about which he was more solicitous than about his daughter."†

One of our own countrymen, the enterprising traveller, Major Denham, affords us a pleasing instance of the attachment with which the docility and sagacity of the horse may inspire the owner. He thus relates the death of his favorite Arabian, in one of the most desert spots of Central Africa. His feelings needed no apology. We naturally honor the man in whom true sensibility and undaunted courage, exerted for useful purposes, were thus united.

"There are a few situations in a man's life in which losses of this nature are felt most keenly; and this was one of them. It was not grief, but it was something very nearly approaching to it; and though I felt ashamed of the degree of

*Smith on Breeding, p. 80.

*Malcolm's Sketches of Persia, vol. 1. p. 41.
†Ibid p. 45.

derangement I suffered from it, yet it was several days before I could get over the loss. Let it, however, be remembered that the poor animal had been my support and comfort—nay, I may say, companion, through many a dreary day and night; had endured both hunger and thirst in my service; and was so docile, that he would stand still for hours in the desert while I slept between his legs, his body affording me the only shelter that could be obtained from the powerful influence of the noon-day sun: he was yet the fleetest of the fleet, and ever foremost in the chase."

Our horses would fare badly on the scanty nourishment afforded the Arabian. The mare usually has but one or two meals in twenty-four hours. During the day she is tied to the door of the tent, ready for the Bedouin to spring, at a moment's warning, into the saddle, or she is turned out before the tent ready saddled, the bridle merely taken off, and so trained that she gallops up immediately at her master's call. At night she receives a little water; and with her scanty provender of five or six pounds of barley or beans, and sometimes a little straw, she lies down content, in the midst of her master's family. She can, however, endure great fatigue; she will travel fifty miles without stopping; she has been pushed, on emergency, one hundred and twenty miles—and, occasionally, neither she nor her rider has tasted food for three whole days.

To the Arabian, principally, England is indebted for her improved and now unrivalled breed of horses for the turf, the field, and the road, as will be shown when we presently treat of the English horse.

[To be oontinued.]

From the Louisiana Register.

ON CUTTING DOWN AND WIND-ROWING SUGAR CANE.

The article which we publish to day in relation to the sugar cane in Louisiana, does not speak as strongly in favor of cutting down, or wind-rowing the cane, as the importance of the subject demands. This is doubtless owing to the circumstance that at the time the Manual was compiled the custom of cutting down the cane was more a matter of experiment, than a course calculated to save millions annually to Louisiana.

The first trial of cutting the cane which we saw, was made by the late John Anderson, on the Mount Hommas estate in the parish of Ascension, in 1828—9. Soon after the vegetation was destroyed by the frost, which we think was about the middle of November, one acre of cane was put in wind-rows, throwing four rows together in the middle space, after the manner of matressing. Along side of this acre, the cane was left standing, and ground the last, of any of the cane so left; but such was its condition that sugar could not be made from it—not even molasses. On the 26th of January, 1829, the acre of wind-rowed cane was ground, and in the appearance of the juice, and in every other respect, worked as kindly, and made as good sugar, and as quick, and in as great quantity per acre, as any that had been cut during the rolling or crop-gathering season. This satisfied us at once that the measure was a discovery equalled only in importance to Louisiana by the introduction of sugar cane itself.

James McCalop, Esq. of the parish of West Baton Rouge, converted the Poplar Grove estate into a sugar farm, and gathered his first sugar crop during the winter of 1829—30. On the 18th of November there was a severe frost, which froze the cane. Mr. McCalop being a new sugar planter, consulted with his sugar growing friends on the expediency of wind-rowing his cane, who all told him, if we remember correctly, that he would ruin his crop. The opinion of his sugar maker was then asked, who replied that he would not take upon himself the responsibility of recommending the measure. What, then, was to be done? Many hundred acres of cane were completely frozen, and according to all probability if it stood in the field, none of it would yield sugar at the end of three or four weeks. Persons who have established sugar estates know something of the cost attendant upon doing so. This was Mr. McCalop's first crop, and the prospect of its almost entire loss, was not calculated to increase the equanimity of his reflections. Under these circumstances, and with a knowledge of the result of the experiment made by Mr. Anderson, he determined to put all his cane in wind-rows, following the plan of the Mount Hommas experiment, and accordingly did so, leaving standing only about three weeks grinding; at the end of which time it would make neither sugar nor molasses—not even vinegar. He then began upon the cane in wind-rows, and found it in good order, and continued making good sugar till the 9th of February—making as good sugar at that time as he had made at the commencement, or at any other time of the season. By way of testing the experiment more fully, Mr. McCalop left five or six rows of cane standing, which at a time long before he was done making sugar, was completely rotten, and entirely useless. In this case, the experiment succeeded beyond the most sanguine expectations of Mr. McCalop. We recollect hearing it stated at the time, that he made a better crop than any person on the coast. We know several persons who pursued the plan in their crops of 1830—31, and since—the number increasing every year; and we have yet to hear the first one say that the plan did not succeed well.

John Nolan, Esq. of the parish of West Baton Rouge, remarked to us a few days since, that he would not for ten thousand dollars, agree to never wind-row his cane, for that he saw no other way to save his crop when an early frost, which frequently occurs, froze his cane to the ground, almost by the time he could begin to gather it. The idea that the cane must be severely touched with the frost before it is laid down, is, Mr. Nolan thinks, fallacious, and for the following reason. Before he commenced grinding, and before cane leaves were deadened by the frost, he cut a road through the cane, which was laid in a wind-row, and ground towards the latter part of the gathering season, and was found not to be sprouted, but made as much and as good sugar as any that was laid down after the vegetation was destroyed, or after the cane was frozen.

After all this, with a knowledge of the fact that such is the variableness of our climate—a difference of sixty degrees Fahr. often occurring in the winter months, during a single week—that the cane which is one day frozen, may the next be thawed, and be on the third, good for nothing; is

it not surprising that there are persons, sugar planters too, who are still skeptical on the subject of wind-rowing the sugar cane, as soon as the leaves and upper joints are deadened by the frost?

From the Southern Agriculturist.

ON THE ROT IN COTTON, AND THE INTRODUCTION OF THE PETIT GULF SEED FROM NEW ORLEANS AS A REMEDY.

Edgefield District, (S. C.) near Mount Vintage P. O. December 14th, 1834.

Sir—I shall endeavor to throw some light on the rot in cotton, and recommend the more general introduction of a better species, than our common green seed.

The last year I purchased in Augusta a bag, containing about six bushels of what is termed Petit Gulf Cotton Seed, and with it planted about ten acres of land; this cotton did not suffer from rot, whilst a fourth, at least, of the balance of my other cotton crop was lost by it. With the seed produced from these ten acres of cotton, I planted seventy acres the present year, and had enough left to replant a supply if occasion should have required it.

The general and fatal effects of the rot the present year, is so well known, that it is unnecessary to enter into a detailed account of it. My cotton was so much exempt from it, that I thought it unnecessary to make any calculation of loss from it, whilst that of my neighbors all around was destroyed in a ratio of from one-fourth to a third of their crops; and although the frost of the 20th October, was so severe as to destroy all vegetation, my cotton book will show five thousand weight of seed cotton picked in, to every effective hand, and in this section of impoverished country, may be considered a good crop, even if no accident had occurred; and this I ascribe to the Petit Gulf seed. I would, therefore, advise every planter of cotton, to procure this seed from New Orleans, let it cost what it will, at least as much as will put him in seed for the next year, and to adopt the same plan every second or third year at farthest, for after that period it will become degenerated by mixture, and then more subject to the evil of which we complain. Perhaps by the general introduction of this seed the enemy may, by the change of food, be driven off entirely, as I am perfectly satisfied, that the rot originates from insects, and we know that every insect has a predilection for a certain kind of food, and this species of cotton is less palatable to them than the common green seed. I am the more convinced of this fact, from having tried a small experiment two years in succession, of some black seed from Peru, to acclimatize it, but found the seasons too short, to make it an object. This cotton was not affected by the rot, whilst other cotton near it was—and if I am not mistaken, the sea island cotton is exempt from this kind of rot.

On a former occasion I have advanced this opinion in relation to insects, and every day's experience confirms me in it. These insects are like some of the human family, a kind of thieving tribe that seldom appear until the sun declines and "the evening shades" prevail, and then come from their concealments to commit their depredations, until he returns to throw his light upon the earth, when they retire to their covers beyond discovery.

The reason why the cotton boles are more subject to the rot in rainy seasons, or when the atmosphere is humid, is owing to a promotion of growth in the plant, making them more tender and susceptible of perforation than in dry seasons, rendering the insect more industrious in taking his food, and leaving the injury behind him. It is always observed after a shower of rain, that insects are more upon the alert in gathering food, and sipping from the breath of Flora the refreshment produced by it, than in a time of drought.

In conclusion, I would further remark, the Petit Gulf cotton, grows more luxuriantly, the quality is better and one-third more can be picked out in the same time than the green seed; and the return is thirty pounds of nett cotton to one hundred of that in seed.

A PRACTICAL PLANTER.

WHEAT INSECT.

The following description of this insect by Prof. Low, agrees with our observation of it about Albany.—*Con. Cult.*

"Certain flies also attack the wheat, at a later stage of its growth. The *Cecidomyia Tritici* is a fly with an orange colored body and white wings. About the month of June the female ascends the ears of wheat, and deposites her eggs in these by means of a fine trunk, and in a few days she perishes. The progeny being hatched in the ear, feed upon the grain. They are very small, from ten to fourteen being sometimes found in one grain, and are distinguished by being of a bright orange color. They do not extend beyond the grain in which they are born; but several grains being thus consumed on one ear, the damage done is often considerable. The larvæ, after a period, fall down to the earth in which they burrow, and remain there till the following summer, when they ascend from the earth in the form of the beautiful fly which has been mentioned."

For the Farmers' Register.

ADDRESS DELIVERED TO THE AGRICULTURAL SOCIETY OF ROCKBRIDGE, BY THE PRESIDENT, DR. R. R. BARTON.

Gentlemen.—The duty of addressing you on this occasion has again been assigned to me, and though I may have wished this to have devolved on other hands, I will cheerfully comply.

I would have been glad to have gone into a review of the operations of our society since our last meeting at Fancy Hill, and have presented a synopsis of our proceedings since that time. But I regret to say, the materials would not afford me much to dwell on. We are yet in a state of infancy, and have not entirely overcome the prejudice against innovation and *book knowledge*. Much, however, has been done to arouse our farmers from their lethargy, and excite emulation and a spirit of inquiry. Your premium for the corn crop was awarded to Capt. Barclay, for the pro-

duce of nearly 64 bushels per acre. As this was on upland, and on a stiff clay soil, the product is creditable, both to his skill and industry; and I regret I have not yet been furnished with his mode of cultivation. And I would here suggest, that this duty should be rigidly enforced hereafter, in *every instance*, before the premium is awarded. On the wheat crop, there has yet been no formal report; but I have been informed, that a member of this society has averaged about 25* bushels per acre, on a field of 18 or 20 acres: and a very successful wheat grower on Buffalo, informed me, he had selected 4 contiguous acres in a field of 40 acres, not very superior to the balance, and after careful measurement, found the 4 selected had averaged 34 bushels to the acre. Here then, in all probability, was an average of not less than 30 bushels per acre, on a 40 acre field. This was a clover lay, and will account for its superiority over other fields in the same neighborhood.

These products, though much less than our soil is capable of, induce me to hope our society has at least commenced the work of reform, and by the stimulus of premiums, and the honor conferred on the successful competitors, is about to awaken farmers to the capabilities of their soil, and their true interest. Such has been the effect of these associations elsewhere, and every where they have been established. Some, it is true, have languished for a few years, and ceased to exist; but this has generally proceeded from their efficient leaders being cut off by death, before they were finally under weigh. But even in these instances, we see their very organization infuse life and animation, and that zeal so necessary to farming, as well as every other avocation; and whilst they taught the farmer his individual interest, and the obligations he owed the community, inspired him with increased love for his country and his home. In Frederick and Albemarle, we know the happiest effects have resulted merely from these societies being organized, and much valuable and interesting matter to the farmer, has been elicited in both quarters. The emulation and zeal excited by these associations are, too, not confined to their immediate members. Those who, from the prejudices growing out of ignorance, from petty jealousies, or from whatever cause, hold themselves aloof and refuse to join us, are still materially benefitted. They feel ambitious to show us, that though not members of an agricultural society, they can successfully compete with us. And as all such associations are formed for the noble purpose of diffusing knowledge and doing public good, they care not in what way this is effected—whether by the mere spirit of rivalry, or by the more commendable motive of pointing out to farmers the errors of their present system, and calling their attention to the agricultural improvements made elsewhere: for there is probably no knowledge which travels with so slow a pace. Important improvements may exist within fifty miles of us, which would require as many years to reach the great mass of farmers, unaided by agricultural societies, and periodicals devoted to the science of agriculture. Two of the most distinguished and successful agriculturists of New York, Judge Buel and Mr. Stimson, have borne ample testimony of the great utility of such societies properly conducted. The former says, "they have effected more for the state than any other set of causes, whatever." And Stimson says, "the farmers have much improved their farms in this town, since our State Agricultural Society was organized, and, of course, their crops have increased in proportion." He further remarks, "he has no doubt that the money which was appropriated by the state to encourage agriculture, has increased the wealth of the county in which he resided, *more than* 20 *per cent. a year since*." I will not, however, encroach on your patience, by adducing any other evidence of the effective aid these societies have rendered, and are capable of rendering the cause so dear to us all. A little reflection will make it evident to all; and if the prosperity of every calling and profession, be dependent on that of agriculture, and this cannot be denied, let us unite in a more determined effort, to fulfil the objects for which this society was instituted, and to render it at least as useful as some of its kindred societies of the North.

But, gentlemen, I would call your attention to what I conceive the *radical* defect in our system—the total neglect of *agricultural education!* Is it not strange, that though the prosperity of all is so dependent on us, this should be entirely neglected? And I assert, without hesitation, that none of the *learned professions*, as they are called in common parlance, require such a range of knowledge as ours. All the sciences are subservient to it, and if not absolutely necessary to the pursuit of agriculture, render it essential aid. But so great is the prevailing error on this subject, that all our youth, esteemed the most promising, because the most pert and precocious, are destined to expound the law to us—to dose us with physic—or to teach us our duty to God and man. This will account for the increase of pettifoggers, charlatans, fanatics, and I may add, of mere clod-hoppers. I mean no disrespect to either of the professions. To one I am decidedly partial, and my best friends are divided amongst them all, and all are necessary, and entitled to our esteem. I complain there is a redundancy in all—a competition carried to an extent, not only injurious to themselves, but really to the whole community. I entreat you then, gentlemen of this society, to commence the work of reform—spare no pains towards educating your sons as farmers, and after they have acquired a thorough knowledge of the sciences, lop off an hundred acres of your farms to each, and let them shift for themselves. But to give a taste and fondness for rural life, I would propose the establishment of colleges on the manual labor system, or, pattern or experimental farms, where they might receive the instruction of the most able professors in every department, and at the same time have their *physical* powers improved, by devoting a certain number of hours of each day, to the various occupations of agriculture. It is much to be lamented, that we so often see the most delicate and feeble of our youth, encouraged in the most severe and sedentary course of studies; because they are condemned to one of the *learned professions:* and instead of entering on the duties of life with a *sound body*, as well as cultivated mind, the former is so enfeebled for the want of its due share of exercise, as soon to be worn out by mental excitement, and sink into a premature grave. On the plan I would propose, all the phy-

* Since ascertained to be 33 bushels per acre.

sical energies would be brought into action and improved, whilst two-thirds of their time would be devoted to the improvement of the mind alone. But much of the theory taught at such establishments, might, during the hours of labor, be reduced to practice, and thus one made subservient to the other. This plan, it appears to me, possesses decided advantages over that of the Gymnasia, of some of the German schools. It may be asked how are such institutions to be supported? And I would reply, as our present schools and colleges. And if in no other way, by legislative aid. Many of these, however, would derive considerable aid from the labor of their pupils, if judiciously directed; and those, whose parents were too indigent to assist, would expect to devote a larger proportion of their time to manual labor. And for this they would be amply rewarded, by the acquirement of their professions in a few years; and thus be enabled to take their stations at once in society, as scientific and practical farmers.

When we reflect that about nine-tenths of the whole community are engaged in agricultural pursuits, we will at once see the great moral influence we are capable of exerting. And it is our own faults if we are the "hewers of wood and drawers of water" for every other class. If not prepared by *education*, we do not deserve to share the loaves and fishes. I am anxious, then, to convince you, that by preparing your sons *as they should be* for an agricultural life, you at the same time qualify them to fill all and every station, with honor to themselves and their country. If they are ambitious of preferment, and their inclinations should tempt them to leave the peaceful and happy walks of agriculture, to embark on the polluted and stormy sea of politics, they have an equal, if not better chance, of attaining office, and this bubble distinction, than the youth of either the other professions. Of this, history affords many examples; and if the acquisition of wealth is desirable, they still have an equal chance: and numerous instances might be cited in our own country, as well as abroad, of men engaged in agriculture, and commencing, too, with little or no capital, acquiring large estates. .

The time consumed with these remarks, has not been misspent, gentlemen, if I have convinced you, or your sons, that our profession is the happiest, and offers *equal* prospects for wealth, honor, and distinction. For myself, I am ambitious of no office, not even that which I now have the honor to hold; and my sole object is to aid in placing our profession along-side the *learned ones*, if not to occupy the foremost rank.

When I before addressed this society, I called their attention to lime as one of our most valuable manures; and its importance will justify a few more remarks. No soil can be deemed valuable that does not contain a portion of this earth, either in a state of nature, or combined by art. This is usually in the shape of carbonate, throughout our lime stone districts. But even here, Mr. Ruffin in his work on calcareous manures, has shown there is a deficiency of calcareous matter or carbonate of lime. And I would beg leave to refer you to his analysis on this subject. An error too frequently prevails amongst us, that stable manure will supply the wants of any soil, and correct its barrenness. This arises from a want of chemical knowledge—for whatever be the quantity of this kind of manure applied to a soil containing the sulphate of iron, its sterility will not be removed. Yet a small quantity of lime will soon render it fertile and productive. This, then, as an important fertilizer, should not be neglected; and much of our spare time in the winter season should be devoted to preparing it.

I would again call your attention, too, to a most important subject; that, of the *best rotation to be pursued.* The four-shift system has been recommended on high authority—and even the three-shift has been advised: but either is too exhausting. Dawson, an able English agriculturist, remarks in Loudon's Encyclopædia of Agriculture, "that the four-shift husbandry is only proper for *very rich land*, or in situations where there is a full command of manure. That by far the greatest part of the land in England, requires to be continued in grass two, three, four, or more years, according to its natural poverty; that the objection made to this, viz. that the coarse grasses in a few years usurp possession of the soil, must be owing to the surface soil not being sufficiently mixed with lime; the lime having been covered too deep with the plough." Here, too, we may derive a useful hint in the use of lime, on our soils infested with weeds and the coarser grasses. It seems then this system is objectionable, unless the land is *very rich*, or there is a *full command of manure;* and if we have to depend on artificial means, it will be necessary to manure *one-fourth* our farms annually. This not only requires a vast expenditure of labor, but none of us have such a command of manure; unless indeed, we had a considerable capital to expend in burning and hauling out lime. But to the farmer, time is money, and so is labor—and whilst labor is so high, and capital so scarce amongst us, we must seek the improvement of our lands, and the consequent increase of our products, by a less costly and operose system, than the four-shift. It is true, many of us might by this rotation greatly increase our annual products for a few years; but eventually, our lands would be exhausted, and our posterity would only inherit worn-out and steril farms. A few of us perhaps, might say, we will leave posterity to take care of themselves—but I hope this number is but few. If there are any such, let us pity them, whilst they fold their arms in their own selfishness —they belong not to the great mass of the agricultural community, who I am proud to say, are excelled by none in patriotism, and a proper regard to the comfort and wants of their posterity.

From the Baltimore Patriot.

THE PORK BUSINESS AT CINCINNATI.

Cincinnati is the greatest pork market, in the known world. The number of hogs slaughtered annually, and the perfection and science to which the art of "hog-killing" has been brought, is indeed astonishing. The business of *butchering*, is carried on distinct from that of *packing*, and by different persons. The most extensive establishment of the kind, is the one on Deer Creek, owned and conducted by Mr. John W. Coleman. At this place, last year, 100,864 hogs were slaughtered. There are four houses situated at different points on the ground occupied, which is a lot of eight acres—the ground is divided into pens some

40 or 50 in number, where the hogs of each owner are put by themselves preparatory to the massacre. About 40 men are employed in each house, and each has his separate and allotted duty to perform, and receive on an average about $1 25 per day. Each house has two scalding tubs, one at each end, so that the work of 'death and destruction' goes on *double* in each building. At each end of the house is a small pen, into which they crowd 40 or 50 hogs, or as many as can possibly be got in—then walks in on their backs, the dark and bloody executioner, holding in his hand a large sledge hammer, with which he 'deals death' to the unoffending victims—after which they are dragged inside the house, a knife passed into the throat, and after bleeding a few seconds, thrown into a kettle of hot water, from thence to a block, where the bristles are scraped off with iron scrapers, made expressly for the purpose—then strung up by their hind feet and dressed—thence removed to another room, where they remain 'to cool' until morning, and then taken on wagons to the packing houses. It is but a little over *one minute from the time the executioner enters the pen and knocks the hog down, till he is strung up and dressed.* The bleeding, scalding, scraping, stringing up, and inside dressing, is *all* accomplished in about *a minute.* This will be thought marvellous, but it is no more strange than true. I have frequently witnessed with astonishment the operation. At one of Mr. Coleman's slaughter-houses, he has a man that opens, removes the offal, and completes the dressing of *three hogs in a minute*—to this man (who is a sort of king among the hog-killers) he pays two dollars and fifty cents per day.

They can slaughter at each of the houses, and have them completely dressed and strung up, (preparatory to removal in the morning to the packing houses,) *six hundred and fifty in a day*, which is altogether, at this one establishment, *twenty-six hundred*—and this done from day light in the morning till dark, say at this time, about *eleven hours*, allowing thirty minutes for dinner. Mr. Coleman informed me, that he has already killed this fall between 50 and 60 thousand, and has been at work but three or four weeks; the only pay he receives is the offal, consisting of rough fat, soap grease and bristles; this is generally worth, nett 20 to 25 cents each hog. It is supposed he cleared at this business last season (and the season lasts but about three months) some 15 or 20,000 dollars. The whole number of hogs killed last year, in the city and vicinity, is ascertained to be a little rising *one hundred and twenty-three thousand.* Deer Creek is a stream running into the Ohio river on the eastern suburb of the city; about half a mile up this stream, these slaughter-houses of Mr. Coleman are situated, and during the whole 'hog season,' this stream, from the houses to the river, is running blood, and generally goes by the name of 'bloody river.'

Others are engaged in the slaughtering business, but not on so large a scale as Mr. Coleman, who is, what Yankees call, a 'smart' man.

From the slaughter houses, the hogs are conveyed in large wagons, that hold from 25 to 40, to the various packing houses, which are situated in almost every part of the city, and there weighed, cut up, packed, &c. The purchasers pay for them as per the weight, after being dressed. These packing houses are upon the most extensive scale. The capital employed every year in the 'hog business,' is immense, probably about *two millions of dollars.* One of the most extensive packing houses in the city, is owned and conducted by Miller & Lee; their building is of brick, three stories high, 120 feet long, 60 wide, with out-buildings, sheds, &c. that cover for aught I know, an acre of ground. These men, who are very enterprizing, have a high reputation for the uniform excellence of their pork, as also for their superior hams; their '*sugar-hams*' are said to be as good as any cured in any part of the union. There are other 'pork houses' equally large, and on as extensive scale. At one of these they can pack and have ready for shipment *two hundred and fifty barrels of pork in one day*, and I am informed, upon a pinch, *three hundred barrels* could be turned out, and that with *thirty men in about fourteen or fifteen hours.* It is, indeed, astonishing, the rapidity with which they put a hog out of sight, when they once get fair hold of him. As at the slaughter houses, a perfect system is kept up, every man has his allotted duty to perform, and there is consequently no interference with each other; every thing goes on 'like clock work;' when the hogs are received, they are first weighed, by the weigher, then passed to the "blocking men," who place them on the several blocks, (two are generally used) when they are received by the "*cutters*," and are very quickly despatched; the various qualities separated and thrown into their respective places. One man weighs for the barrels, (200 pounds,) and throws the meat into the "*salt box*," from which the "*packer*" receives it, and when the barrel is packed is turned over to the "cooper," who heads it; it is then bored, filled with a strong brine, plugged, branded, and ready for shipment. Fifty pounds of Turks Island, or other coarse salt, is allowed to each barrel of pork.

The lard is cut into small pieces before going into the kettles; the leaf lard goes into one kettle, and the rough lard into another; there are generally eight or ten men employed in the lard department, when an average of *two hundred kegs, or about nine thousand pounds are turned out daily.*

A large quantity of "bulk meat," is generally produced, this is from small hogs, too light for prime pork. The hams are smoked and generally canvassed before shipping. They are, however, very unlike a lot of Kentucky canvassed hams, sold a few years since at Port Gibson, which on examination, after the seller had gone, were found to be of *wood*, instead of "hog meat." Better hams cannot be procured than those smoked in Cincinnati. The hams cured by Miller & Lee, W. Hartshorne, W. M. Walker, William Irwin, and in fact, by all our "pork makers," can rarely be equalled in quality. Technical names are used in pork houses as well as in most branches of business. The following are a few of them: *blockers up—cutters—briners—kettle tenders—choppers—lard trimmers—ham trimmers—bulkers—lard drawers—packers—coopers—weighers*—&c.

I am informed, the largest quantity of pork packed last year, by one house, was Burdsell and Davis, for the Messrs. Winchesters of Boston, the number of barrels being between five and 6000. No one establishment will pack as much this year. Many of our merchants are engaged

largely in the packing business, at various points in the vicinity of the city—at Rossville, Hamilton, Middletown, Lawrenceburgh, &c. It is estimated that the quantity of pork exported last year, from Cincinnati, which includes that packed in the above towns, fell very little short of 45,000 barrels, about 85,000 kegs of lard, 270,000 hams, besides shoulders, sides, bulk meat, &c. One of our enterprising citizens alone purchased, I am told, last year, 35,000 kegs of lard, and fortunately it proved a profitable investment. There are altogether in the city, about 26 or 27 pork houses, and they now employ about 10 to 1200 men, at an average of a dollar per day. At the commencement of the season hogs appeared plenty, and were purchased at a fraction lower than last year, say three dollars per hundred for those averaging 280 pounds. I am informed that they are now becoming more scarce, and that the price is advancing. There will not be so many packed this year as last. Some that were engaged in it last year, lost more or less money, owing to the distress in the country, and the impossibility of effecting sales at fair prices; so that there are, probably, not as many engaged in the business as formerly. Money now being more plenty than last year, and a general demand existing for the article, ready sales at fair prices will be made. The demand now in this market for pork and lard is good, and a gradual advance in price has and will continue to take place. Most of our pork packers are men of wealth, and can consequently "hold on," there will be no necessity of forcing sales. However, they cannot pack enough before the season closes to supply the demand, which is much increas'd by many of the army contractors being in the market, and wishing to purchase to fill their contracts."

From the Florida Herald.

FLORIDA COFFEE.

MR. EDITOR,—I have brought under cultivation a species of coffee which grows wild in Cuba, and has found its way to the city of St. Augustine, supposed to have been brought there many years since by the Spanish people. It is completely naturalized to our climate, and will grow in any of the cotton growing states. I recommend the cultivation of it particularly to the planters as another staple of immense value, which will realize more than any other staple of our country now under cultivation, even if we obtain not more than half the price of West India coffee. It is made use of in the interior of Cuba, by the inhabitants as coffee. It also grows wild on the banks of the Mississippi, around New Orleans, where it is collected by the French people and made use of as coffee.

I have made use of it in my family for three months, and find it superior to the green Cuba coffee. It improves from age; being equal to the best of coffee in three months after it is collected. Those who are peculiarly fond of the taste of the green Cuba coffee, can obtain it by mixing at the rate of one pound of the green Cuba coffee with four pounds of Florida coffee.

It is an annual plant and must be cultivated in the same manner as cotton, leaving the plants at a greater distance, as it grows most luxuriantly from ten to twelve feet high on good land. It will grow on the poorest land which has been exhausted from cultivation, and will produce a good crop. Plant it at the same time that cotton is planted, on beds five feet apart. On good land plant your seeds five feet apart dropping ten or twelve seeds; cover it lightly when the plants are sufficiently grown, thin them out, leaving a single plant at the distance of five feet: poor lands may be planted nearer; two pounds of seeds will plant an acre of land; one acre will produce from fifteen hundred to two thousand pounds of coffee; it blooms from early in July until late in October, ripens from early in August until frost, or early in November; the seeds are about the size of a grain of wheat, of an olive color, each pod containing from forty to sixty grains of coffee. The pods must be collected as fast as they ripen, and when thrashed, which is performed with a common stick from the woods, it must be done in a close room with a tight floor, and after it is winnowed it is then fit for use; neither horses, cattle or hogs will eat of the plant; it is not disturbed by caterpillars or any insects; it returns more foliage to the land than any highland cultivation; it is also a great acquisition to the rearing of bees as pure honey rises on the stem of each stalk of the leaves, which is sought after by the bees and ants.

The Editor of the Southern Agriculturist, and all Editors in the cotton growing states will please insert the above for the public benefit.

I am yours respectfully, &c.

ABRAHAM DUPONT.

Mantanzas, East Florida, Nov. 25th, 1834.

Seeds may be obtained by applying to Messrs. J. & C. Lawton, Charleston, S. C.; and of Col. Francis Gue, of St. Augustine, E. F.

The following extract answers queries which first appeared in the Farmers' Register, (page 8, Vol. II:)

From the Southern Planter

USEFUL HINTS.

Early County, (Ga.) Nov. 18th, 1834.

Dr. Bartlett—I see a request in Vol. 2 No. 25, entitled "Odds and Ends" by J. K. desiring to know a sure remedy for destroying nits and lice on hogs, &c. Take the oil of bays and spread it on a piece of leather and rub it well upon the animal, and I warrant that it will kill them speedily. What is the best remedy for worms in horses? Take nux vomica and rasp it down, say one button, and mix it with a little meal and give it to the horse. To destroy house flies take nux vomica rasp it up and pour water to it and steep white cloths and hang them up, and that will destroy flies. To prevent the ravages of the fly that eats tobacco plants, take oak bark and make a fire after sun down to the lee of the bed so the smoke may not go among the plants, or take corn meal bran and scatter it over the bed. Whether the bran collects birds that destroy the fly, or whether it collects ants, or whether they prey upon the bran themselves, I cannot determine. * * * *

Yours, AARON GOOLSBE.

Extracts from the last edition of the "Complete Grazier.

ON THE ECONOMY AND MANAGEMENT OF THE DAIRY.

Of milch kine.

The value of the respective breeds of milch kine having been already stated,* it will rest with the farmer to make his selection, according to the nature of the soil in his occupation, and of the particular branch of dairying which he means to pursue: for if his object be to sell the milk, or to suckle calves, quantity must be the material consideration; and quality, if he mean to produce butter and cheese.

It is a general observation, that the richest milk is produced by the red cow, while the black sort is reckoned best for the purpose of breeding, as her calf is usually both stronger and more healthy than the offspring of the red species. This, however, is one of those errors which have been transmitted, through a long series of years, without being founded on fact. The red cows have, indeed, been long celebrated for the excellence of their milk; and the calves of black cows have been proverbially deemed good: but color in this respect is a matter of no moment; the breed alone should claim the farmer's attention. But cows even of the same, and of the best breeds, will not always yield the same quantity of milk; and of those which yield the most, it is not unfrequently deficient in richness. Trials, are, however, easily made, by keeping the cows on the same food, weighing the quantity consumed by each, and measuring their milk; then keeping and churning it, a few times, separately: thus, reckoning the cost of the provender, and the produce of the milk of each, and comparing the result, it will be soon discovered which is the most profitable animal. Comparisons of this kind are not often made; for farmers usually purchase whatever stock they can most conveniently, or most cheaply, lay their hands on; and are then content to keep them so long as they turn out tolerably well. This, however, is the height of bad economy; for an indifferent cow will eat as much and require as much attendance, as the best; and thus occasions a daily loss, that will soon exceed any probable saving in the original price; whereas the man who takes the pains to acquire a good stock, and has the sense to keep it, lays the sure foundation of a fortune.

In point of quantity, large cows, of whatever breed, will generally be found to have the advantage over the small ones. In this particular, the Tees-water breed excels; but they require a rich soil, and if the land be not of the best kind, a Suffolk, or a Scotch cow, will be preferable. It is common for cows of the first mentioned breed to give as much milk as thirty quarts a day; and there are instances of even more; but they are of the old Yorkshire stock, and do not belong to the improved breeds of short horns, and their milk is not considered equal in richness to the Devon or the kyloe.

In order to ascertain their comparative merit, two experiments are recorded to have been made in the county of Durham, by different persons of impartiality and experience, who each got two ounces of butter from a quart of kyloe milk; while a quart from the short horned breed produced, in one instance, only one ounce, and in the other but very little more. From a further experiment on six cows of the short horned improved breed, it however appears, that the product of a quart of milk from each was as follows:—

	oz.	dr.
No. 1	3	0
2	1	6
3	1	12
4	1	10
5	1	14
6	1	6

The great difference between No. 1, and the remainder, is accounted for by the age of the former being six years, and that of all the others only two; for the produce of butter increases up to a certain age, and cows are most productive from four to seven years old. The result of other trials of the *value* of the milk of the two breeds, varied, but the *quantity* was uniformly in favor of the Yorkshire.*

In other counties the results have been stated thus:—in Devonshire, according to Mr. Vaucouver, three gallons of milk give 20 oz. of butter; Mr. Wedge says, that, in Cheshire, one gallon yields 16 oz.; Mr. Wakefield states the Lancashire return at four and a half pounds from about sixteen gallons, in one instance, and in another, at eight pounds from the same quantity; and Mr. Aiton calculates the average, in Ayrshire, at six oz. per gallon, though that is frequently exceeded in particular instances.

The same gentlemen state the average quantity of milk produced by dairy cows, until dry, in those several counties as follows:—in Devonshire, *twelve*—Cheshire, *eight*—Lancashire, *six*—and Ayrshire eight quarts, per day. Mr. Aiton, however, rates the produce of the best Scotch cows much higher, and estimates their yearly produce, thus:—

Days.	Gallons per day.	Gallons.
1st 50	6	300
2nd 50	5	250
3d 50	3½	175
4th 50	2	100
5th 50	2	100
6th 50	1½	75
300	average per day 13⅓ quarts;	1000

Many instances of superior productiveness are cited in the county reports, and other publications, which it would be tedious to enumerate; but one of those is too curious to be omitted. It is that of a cow belonging to W. Cramp of Lewes, in Sussex, which, during four successive years, afforded the following produce; viz.

	Quarts of milk.	Pounds of butter.	Profit.
1805	9421	541	£41 5 11
1806	4137	450	30 16 1
1807	5782	675	51 13 1
1808	4219	466	29 19 7
		Thus leaving a nett profit of	£153 14 8

After deducting the expense of feeding; but the

* See No. 4, Farmers' Register.

* Agricultural Survey of Durham, p. 237.

charges of management are not included, and dairy produce was then high.

In one superior Epping dairy, where much attention had been paid to the selection of the stock, the North Devon breed is considered superior to both the short horned and the Leicester for the richness of the milk, though the quantity is one fourth less; they bear hard living better in the winter, and their calves are found to excel others both in the disposition to fatten, and in the color and quality of the meat.*

It will, however, be generally found, that, supposing the food to be the same, those cows which yield least in quantity, have the richest milk. Yet both quantity and quality constantly vary, even in individuals of the same breed, age, and appearance, and are always affected by the mode of feeding. When kept on old meadow, the butter will have a better flavor than when the cows are fed on artificial grasses, or even on land that has been newly laid down to pasture, and although grains, cabbages, turnips, and other succulent roots will increase the quantity of the milk, yet hay and corn will add most to its richness. Lean cows never yield either so much, or so good milk, as those which, without being actually fat, are kept in proper condition; and all gradually fall off in quantity after calving, until they become dry.

Whatever breed may be selected, there is still a material distinction to be observed between the form of a cow intended for the dairy, and that of one intended for fatting. While the latter should possess, as nearly as possible, all the most remarkable points, already described, of the best oxen, the milch cow should, on the contrary, be thin and hollow in the neck; narrow in the breast and point of the shoulder, and altogether light in the forequarter; with little dewlap, and neither full-fleshed along the chine, nor showing, in any part, much indication of a disposition to put on fat. The hide should be thin, the hair fine, and the tail small. But, especially, the udder should be full and round, yet thin to the touch, and should be of equal size and substance throughout. If it shows more behind than before, it is deemed a sign of the milk falling off soon after calving; and if it feels coarse and lumpy, the bag will be found not to contain a large quantity. The teats should stand square, at equal distances, and should neither be very large, nor very thick towards the udder, but nearly equal, yet ending in a point. Another very material consideration is the temper; for kindly cows will not only give less trouble than those of an opposite disposition, but they are generally remarked to possess a greater quantity of milk; and, from parting with it more readily, they are less subject to fall off in their milking.

Of the pasture and other food best calculated for cows, as it regards their milk.

As the nature of the grass, or other vegetables, has a very considerable influence on both the quality and the quantity of milk which cows produce, the attention of the industrious farmer will, of course, be directed to this point; for, as instances have occurred, where *six* milch kine, fed on some pastures, have yielded as much milk as *nine*, or even a *dozen* will afford on inferior ground, it is obviously his interest to have his cows well fed, rather than to keep up a particular number, without heeding whether they are properly supplied or not. Hence, it will be proper to suit the milch cows to the nature and fertility of the soil; and on no account to purchase them from pastures superior to those destined for their reception.

The feeding of milch kine is divided into two branches, viz. *pasturing* and *house-feeding*.

In order to obtain an abundant supply of good milk, where the pasturing of cows is adopted, it is not alone requisite that the grass be plentifully produced, but also that it be of that quality which is relished by the cattle; and this property will generally be found in some old natural pastures that have been properly managed. Much attention, however, is necessary, in order to eradicate the crow-garlic, or garlic-hedge-mustard, and similar weeds, which, when eaten by cows, uniformly impart a rank flavor to their milk, and consequently to the butter which is made from it. It is likewise worthy of note, that though the long, rank grass, growing in orchards or other places, in general feeds well, and produces a flush of milk, yet such milk will neither be so rich, nor carry so much cream in proportion, as the milk of those cows which are fed upon short fine grass; nor, of course, will their butter be so good.

The quality and quantity of milk is materially affected by driving them to a distance from one pasture to another; hence it will be proper to have the cow-sheds in as centrical a part of the farm as possible. It is also of essential importance to have pastures well sheltered and inclosed, as the produce of milch kine will be greatly improved, or deteriorated, according to the attention or disregard bestowed on this point; for, when confined within proper enclosures, they not only feed more leisurely, and are better protected against bad weather, but are also less liable to disturbance than when they wander into other fields; and both moderate warmth and quiet are mainly conducive to an increase of milk.

With regard to the housing of milch kine during summer, the general practice is, where there are proper enclosures, to send them out in the evening, in order that they may lie out during the night, while, during the day, they are kept more cool and quiet in the cow-sheds than in the fields. The advantages thence resulting are, that they breathe a purer atmosphere, and there can be but little doubt that, at that season, they yield more and better milk than if they were wholly confined.

Indeed, in some of even the most exposed situations in the west of Scotland, the cows are turned into the fields every day throughout the year, unless in the most stormy weather, and some persons even keep them constantly out, both day and night. Although we cannot recommend the latter practice, yet it is certain, that animals thus treated are much more hardy, and less exposed to injury from sudden changes of the weather, than when they are kept warm. They are also said to yield more milk; in proof of which assertion is the common observation, that when cows, accustomed to lie out, have been housed at night, they have been found more dried up in their milk on the following morning, than others that had even been exposed to a storm.

In the winter, however, milch kine are usually

* Agricultural Survey of Essex, Vol. II. pp. 281, 200, &c.

fed in houses; and, where the practice of keeping them in stalls, does not prevail, it will be proper to have warm sheltered yards, furnished with open sheds, in which they can feed without exposure to the severities of the weather. The latter is the preferable practice; for pure air is indispensable to health; but if stalls are used, the cow-houses should be well ventilated, and situated rather adjoining a pasture, or a yard into which the cows should be frequently turned.

In the management of milch kine, it is essential that they be, at all times, kept in high health and good condition; for, if they are suffered to fall in flesh during the winter, it will be impossible to expect an abundant supply of milk by bringing them into high condition in the summer. Hence, if cows are lean when calving, no subsequent management can bring them to yield, for that season, any thing like the quantity they would have furnished in case they had been well kept throughout the winter. Farmers cannot indeed be easily persuaded to afford high feeding to unproductive stock; nor is that requisite for cows that are dry; but the common practice of keeping them during that period, on straw alone, or on the worst hay, is very improvident, and the injury to the future produce of the cow, will be more than equal to the saving in provender. During that inclement season, therefore, some nutritious food should be provided for them, and the animals be kept moderately warm; for beasts will thrive more and yet not eat so much when kept warm, as when they are shivering with cold. When fed on straw, or coarse hay alone, without any green food, till towards the time of calving, their milk vessels become dried up, and they will not afterwards yield either much milk, or of good quality, until they are turned out to pasture. The milk of lean cows is always thin, and as deficient in quantity as nutriment; it is therefore important that milch kine should be maintained, at all times, not only in good condition, but in what may be termed *a milky habit*. For this purpose, a small quantity of any of the succulent roots will be found sufficient in addition to their usual dry food: even a very few Swedish turnips in a day will be found essentially useful in preventing costiveness, binding of the hide, and the drying up of the juices; and will be conducive, not only to the present health of the animal, but to her preservation in that state of body in which she will be most fit to profit by the superior nourishment to be obtained in the spring.

In Holland, where it is well known that the management of cows is carried to the highest perfection, they are curried in the same manner, and kept as cleanly, as horses in a stable.* Such, indeed, is the attention paid to cleanliness, that it is by no means unusual to see cows, when housed, kept with their tails suspended, in the same manner as that of horses after they have been nicked, in order to prevent them from being soiled with the dung. This, perhaps, is carrying the minutiæ of neatness rather far, but if an error, it is at least one on the right side, and the invariable high condition of all Dutch dairy stock is the surest proof of their superior management; the chief features of which are—care in keeping them dry as well as clean, and attention to the purity of their water. This last is considered of such importance that it is not even suffered to be tainted by the breath of the beasts; and yet, it is a fact that cattle frequently prefer the water in ponds impregnated with the urine of other animals: but this probably arises from its containing salts, which instinct points out as beneficial to their health.

It has already been intimated, that the best summer food for cows is good grass, spontaneously growing on sound meadows; but when these are shut up, *tares* and *clover*, either cut or pastured, may be very advantageously substituted. There is a prejudice against tares, as they are supposed to render the milk *ropy:* but we have been assured by a farmer who kept twenty-one cows of a mixed breed on the verge of Epping Forest, that he soiled them night and morning, during a great part of the summer on tares, without any other assistance than the common pasture of the forest, and that not only there was not the least appearance of ropiness in the milk, but that it was far richer than when the cows were fed on meadow grass, and that the butter was always of the finest quality. The other additions to hay for winter food are those most commonly employed for fatting cattle:—*parsnips* and *carrots*, which roots not only render the milk richer, but also communicate to the butter made from such milk a fine color, equal to that produced by the most luxuriant grasses:*—the *mangel-wurzel*, which, on the continent, is preferred to every other vegetable for feeding cattle in general:—*potatoes*, on which cows will thrive well, so that with one bushel of these roots, together with soft meadow hay, they have been known to yield as large a quantity of sweet milk, or butter, as they usually afford when fed on the finest pastures; but alone, it has been proved by various experiments that potatoes will not support a cow in milk; they may add to the flow of it when given with hay, but the chief dependence must be upon the latter; carrots are far superior:†—*cabbages* are likewise of eminent service in this respect, but they require to be given with a good portion of fine hay; and, as well as *turnips*, the utility of which is too well known to require any particular detail here, they are apt to impart an unpleasant flavor to butter, unless great care be taken to remove all the decayed leaves:—*fog*, or *rowen* grass reserved for winter use, which is cut and carried to the animals:—pulverised *oil-cake*, *linseed-jelly*, and *grains*. By the judicious use of these various articles, together with a due admixture of dry food, considerable nutriment is thrown into the system, while the regular secretions will be excited, and the quality of the milk very materially improved.

Mr. Cramp's cow, mentioned in the last chapter, was soiled during the summer, on clover, lucerne, and roots—chiefly carrots—three or four times in

* Baron d'Alton in Communications to the Board of Agriculture, Vol. I.

* In the Island of Jersey, about 35 pounds of parsnips are given daily to the dairy cows, with hay. They are found to improve the quality of the cream, which is more abundant than from an equal quantity of milk from cows differently fed. *Seven quarts producing as much as seventeen ounces of butter*—and the flavor of the latter is superior. *Quayle's General View of the Norman Isles.*

† See the Agricultural Survey of Sussex, p. 250.

the day; and had four gallons of grains and two gallons of bran mixed, given to her regularly at noon. The same allowance of grains and bran was continued throughout the winter, when she had hay in addition, with occasional roots: she was fed five or six times in the twenty-four hours; and always when she was milked. Great care was also bestowed on the cleanliness of her stall and trough; and her udder was daily washed with cold water.

In some parts of Flanders, after the corn crops have been reaped, the ground is lightly ploughed, and sown with *spurry*. The cows are tethered on it in October, and a space allowed to each proportioned to the quantity of food that is necessary. The butter from the milk thus obtained, is called *spergule butter*, and is not of equal quality with that produced from the common food.*

The following mode of feeding milch kine is practised, to a great extent, in the county of Middlesex, from which the inhabitants of London chiefly derive their milk. During the night the cows are confined in stalls, and about three o'clock in the morning each has a half-bushel basket full of grains given to her; when the operation of milking is finished, each receives twice that quantity of turnips, and shortly after one truss of the finest, softest, earliest made, and greenest meadow hay is divided among ten cows. These various feedings are usually made before eight o'clock in the morning, when the animals are turned into the cow-yard. Four hours after, they are again tied up to their stalls, and supplied with the same allowance of grains as they had received in the morning; on the conclusion of the afternoon milking, (which generally continues till near three o'clock,) they are served with a similar quantity of turnips; and in the course of another hour, with a like allotment of hay. This method of feeding usually continues throughout the turnip season, that is, from November to March: during the remaining months they are fed with grains, tares, cabbages, and the proportion of rowen, or second-cut meadow-hay, already mentioned; and are fed with equal regularity until they are turned out to grass, when they pass the whole of the night in the field; and, even, during this season, they are often fed with grains, with which some cow-keepers mix common salt, with a view to preserve them longer in a sweet state. But this practice has much declined, as the proprietors, who tried the experiment, did not meet with an adequate return for their labor and expense;†

though it has been asserted, that the mixing of salt with the food of cows (which will eat it with great avidity) both increases the quantity and improves the quality of the milk, while it contributes to promote the health of milch kine.

In Yorkshire, milch cows are allowed the best pastures during summer, and are usually housed about Martinmas, when their food is generally turnips and straw, or where turnips are not cultivated, hay; but a difference is made between those cows which are rather fresh of milk, and those which are nearly dry, the former having a larger portion of turnips, with the addition of hay, whilst the latter are put off with little else than straw until within a few weeks of calving, when hay is allowed.* In Essex the system is nearly the same, except that the produce of the dairy being chiefly butter, turnips are seldom given: rowen hay, as being the softest and the greenest, is preferred, and the consumption is calculated at two loads (of eighteen cwt.) in the winter, with two acres of summer pasture, and some straw while drying off.†

In the course of the preceding statements, the *stall*, or *house-feeding*, of cows during the winter in Holland has been mentioned; and, from the remarks of Baron d'Alton,‡ it appears that this method of feeding is there adopted throughout the year with greater profit than can be obtained from pasturing. The Baron indeed says, that cows must be early trained to the confinement of stall-feeding, otherwise they do not thrive; but, as the advantages of soiling and stall-feeding are so great, there can be no difficulty in adopting it, and executing it where it is intended to keep calves of a particular breed, as they may be easily reconciled to the confinement.

Sea-weed has of late years been given to cows by way of *condiment*. Mr. Macallum, a cow-keeper of Edinburgh, gives his milch cows sea-weed in lieu of turnips, when these roots are scarce and dear, particularly in the months of February, March, and April. He uses the *fucus digitatus*, or digitated sea-wrack, and the *fucus serratus*, or serrated sea-wrack, but not the *fucus vesiculosus*, or common sea-weed, lest it should fill the animals with *wind*. Mr. M. begins by parboiling the sea-weed, and giving the cows some of the liquor: at first they sometimes refuse it, but when they drink the water, they are then offered some of the parboiled weed itself; and, when they eat it parboiled, it is afterwards gradually given to them *raw*. He gives each cow, once or twice a day, as much as a person can neatly carry at once between his two hands. These marine plants operate as a gentle laxative, and Mr. M. thinks that their use promotes the health of his cows, and consequently increases the quantity of milk they yield.‖ This is an interesting fact, well deserving the notice of the attentive farmer on or near the sea coast, particularly in the vicinity of the numerous large and populous places of resort for sea bathing, where cows are numerously kept;

* Sir John Sinclair's hints on the Agriculture of the Netherlands, &c.

† Middleton's Agricultural Report for the County of Middlesex, 8vo. This intelligent reporter further states, that brewers' grains may be preserved, in a sound state, from March till summer, when brewing is discontinued, by tightly treading them down in pits below the surface of the ground, and covering them with a layer of earth, in order to exclude the air and prevent fermentation. They are in fact, preserved during a much longer period, and are said to have been found sweet, and in good order after a lapse of years. The grains increase the *quantity* at the expense of the *quality* of the milk; but this answers the purpose of the London cow-keepers, to whom the quality is a secondary consideration. The same may also be said of *common* turnips, though *Swedes* may be used without disadvantage.

* Agricultural Survey of the North Riding of Yorkshire, p. 257.

† Agricultural Survey of Essex, Vol. II. p. 271.

‡ Communications to the Board of Agriculture, Vol. I.

‖ Sinclair, Vol.e II. Appndix29.

and may prove a useful hint to those who are at a distance from the coast, in regard to the employment of common salt.

The use of *salt* for various agricultural purposes to which it could be profitably applied has hitherto been prevented by the heavy duty on its consumption. That impediment is now, however removed; and it may, therefore, be expected to become an object of serious attention to every one engaged in husbandry, and more particularly of those engaged in the management of cattle; some of the advantages of its application to which stock may be thus enumerated:—

I. It restores the tone of the stomach when impaired by excess in other food, and corrects the crudity of moist vegetables and grasses in a green state.

II. It helps digestion, keeps the body cool, by which many disorders are prevented; and it destroys botts.

III. It renders inferior food palatable; and is so much relished by cattle, that they seek it with eagerness, in whatever state it may be found, and have been rendered so tame by its use, that if they stray from their pasture, they will return at the usual time for their accustomed allowance.

IV. When given to cows, it increases the quantity of their milk, and has a material effect in correcting the disagreeable taste it acquires from turnips.

It has, in fact, been long used for cattle of all descriptions in the East Indies, in America, and in various parts of Europe, and among other experiments of its effects that have been tried in this country, is one recorded by Mr. Curwen, who employs it largely at his extensive farms, and who gave it from the 19th November, 1817, to the 3rd February, 1818, to his stock, in the following proportions, viz.:

Stock.	Number.	Quantity.
Cows and breeding heifers	40	4 oz.
Young and fat cattle	43	3 "
Working oxen	18	4 "
Heifers and young oxen	21	2 "
Young calves	20	1 "

During which time they remained in the highest health.*

Steamed chaff may also be given to milch cows with great advantage. Mr. Curwen, whose judicious zeal for the improvement of agriculture is too well known to require any eulogy, uses a steam boiler of 100 gallons contents,† on each side of which are fixed three boxes, containing eleven stone each of chaff, (cut hay and straw, with the husks of corn,) which, by being steamed, gains more than *one-third* of its original weight. The steam is conveyed by various stop cocks into the lower part of the boxes; and thus two or three boxes may be steamed at the same time; the quantity of fuel required is about two lbs. for each stone of chaff.

In giving the steamed chaff to the cattle, two lbs. of oil-cake are mixed with one stone of chaff; and the milch cows and oxen are fed with it morning and evening, having an allowance of one stone at each time. On being taken from the steamer, the food is put into wooden boxes, which are mounted on wheels, to be drawn to the place where it is intended to be used; and the chaff requires to stand some time before it is fit for use. Mr. Curwen estimates the daily cost of food for each cow as follows:

	Pence.
Chaff, two stone, steaming, &c.	1
Oil-cake, four pounds	4
One cwt. of turnips	4
Wheat straw	1
Total	10

The average of milk on a stock of thirty-six milch cows, was nearly 13 wine quarts for 320 days; which was sold at 2d. per wine quart. The calves brought from £2 to £5 for rearing. The produce is stated by Mr. Curwen to be nearly half clear profit, estimating the manure as equal to the calves. The cows were never suffered to be turned out; and to prevent their being lame, their hooves were properly pared, and they stood with their fore feet on clay. One great advantage attending this method was, that most, if not all the milch cows were in such a condition that, with a few weeks' feeding after they were dry, they became fit for the shambles, with very little loss from the first cost. As a substitute for chaff and oil-cake, Mr. Curwen recommends cut hay; which, when steamed, would make a much superior food, and he entertains no doubt would greatly augment the milk, as well as benefit the health and condition of the animals. Of this there can be little question; for straw, or even the corn-husk, which is said to contain more nutriment, can add but little to the product of milk: it may keep store animals from starving, but it will never improve their flesh; and it may be received as an axiom, in feeding all animals, that the value of the food is in proportion to the quantity of nutritive matter contained in its component parts. Bulk is also necessary to sustain the action of the stomach; but it serves no other purpose.

Mr. Curwen gives cooked food from October to June, nearly eight months out of twelve, and his plan of treatment has been adopted by several farmers in different parts of the kingdom, with the most complete success: it is also partially practised in the Isle of Man, where the cottagers have long been in the habit of pouring boiling water on the chaff with which they winter-feed their cows;* as well as in some parts of Scotland. *Pea-meal* is also given by some Scotch dairy-men, by whom it is said that "no food is found to produce so much effect." The following method of preparing it, combined with chaff and turnips, as customary at Kyle, in Ayrshire, which we copy from a recent publication, seems to merit particular attention:—

"Take a bushel of chaff and eight or ten sound yellow or Swedish turnips, having the tops and

* See the Appendix to Sir John Sinclair's Code of Agriculture, p. 43.

† An engraving of it is given in the 30th volume of the Transactions of the Society of Arts, from which it obtained the lesser gold medal. See also, for various observations on steaming, together with plates, the publication termed "*British Husbandry*," in the Farmer's Series of the Library of Useful Knowledge, p. 129.

* Agricultural Survey of the Isle of Man, p. 109.

tails carefully taken off, and boil them together four or five hours. Add as much water as will cause the hand to move easily through the mass. Squeeze down the turnips, and add three pounds of pea-meal. Give this to a cow in the morning, and the same in the evening, with as much sweet hay as she will eat up clean five times a day, and without much expense, her butter will be as rich and of as fine a flavor as can be produced in winter. Should the peculiar flavor of the turnip be detected, which is not likely, a small quantity of saltpetre put to the cream will take it off."*

The plan of feeding adopted by one of the greatest dairy farmers in Scotland, Mr. Ralston, of Fine-View, is as follows: until the grass rises and affords a full bite, the cows are kept in their houses, but are then sent out to pasture. In hot weather they are fed on cut grass, in the house, from six in the morning until six in the evening, and are out at pasture all night. As the soil is dry and sandy, when rainy weather comes house-feeding is discontinued. In harvest, when the pastures begin to fail, the cows are fed partly on second clover, and partly on turnips scattered over their pasture. As the weather turns colder in October, they are housed at night, and in severe weather during winter; also through the day, receiving oat-straw with turnips. These roots are partly stored, and the supplies of them ordered so as to protract the feeding; when they fail, Swedish turnips and potatoes follow, with dry fodder. Chaff, oats, and potatoes, are boiled for the cows after calving; and the calves get rye-grass and clover-hay during the latter part of the spring.

The cows employed are of the Ayrshire breed, and are said to yield the amount of their own weight and value annually in cheese.†

[To be continued.]

For the Farmers' Register.

ON HORIZONTAL PLOUGHING.

Much has been written in this work, on the subject of hill-side ditches and horizontal ploughing. Believing this to be a most important improvement for our middle country, and, indeed, one without which, all others would be nearly unavailing, I beg to be indulged in a few remarks on it.

The writers on this species of improvement, have differed a little on the details of management, but have conducted their differences of opinion with candor and gentlemanly courtesy. Pity, but political and religious polemics could disagree as pleasantly as we farmers! The design of all the plans of levelling recommended, is doubtless, to save our gravelly and sandy country from being torn into gulleys—to prevent the upper and most fertile earth from being washed away, and to preserve—not merely the moisture, but also the soluble matters contained in putrescent manures, on the land.

The retention of moisture, in our arid country, is no trivial matter. Our crop of Indian corn is almost every year shortened by drought. Every practical planter knows how much this evil is obviated, by covering up the roots, while there is what we call a *good season* in the earth. It must also be admitted that any mode of ploughing which confines and retains the water of hasty showers, must be beneficial. There can be little doubt, but that our thirsty high lands need as much ditching to keep the water on them, as marshy low grounds do to take it off.

Gulleys form, perhaps, the greatest opprobrium on Virginia cultivation. The traveller, go almost where he may, is disgusted by their ghastly yawning. But if the "looks" were all, we would not so much regard it. Gulleys operate on land, as ulcers do on animals. They drain from it, not only its moisture, but all its valuable juices. The plan of horizontal ploughing and ditching, affords the only remedy and preventive. I would here beg leave to offer my cordial thanks, both to those who first invented, and to those who introduced into middle Virginia, either of those improvements. I would be glad to do homage to every benefactor—more especially to every agricultural one. I have heard it stated that some merchants in Scotland invented horizontal ploughing, and that the late Gov. Thomas M. Randolph, of Albemarle, introduced it here. I know not, to whom credit is due, for the discovery of hill-side ditching. Perhaps the editor, or some of his correspondents could tell. It has been about twenty years, I think, since I learned that it was practised both by Mr. Bruce of Halifax, and Mr. Humberston Skipwith of Mecklenburg.

I think I have seen more soil carried off from a field by one great fall of rain, than could be brought back by the whole laboring force of the farm in an ordinary life-time. Any remedy for so great an evil—though far from infallible—though practically very difficult and very expensive—would deserve prompt and serious consideration. The remedy proposed, may be pronounced almost infallible—when properly executed—and the difficulty and expense—beyond that incurred in the ordinary mode of cultivation—unworthy the regard of a man determined to improve.

The operation by means of what is usually termed the rafter-level, is acknowledged to be tedious, especially in windy weather. But it may be necessary to use it, where great accuracy is desirable, in giving one inch fall for every span of the rafter, in very steep lands. But, having no steep lands to operate on, and no experience in their management, I would not presume to pronounce on the best mode in relation to them. I know that very broken grounds afford frequent outlets from furrows and ditches, for the water, along their numerous rivulets and irreclaimable ravines. In such situations, all surplus water may be readily discharged; and it is a matter of importance to do this along channels of such gradual descent, as to remove the danger of washing. This is usually done, I believe, by nailing a little block about one inch thick, on the foot of that leg of the rafter pointing towards the proposed outlet, while as strict attention is paid to keeping the plumb-line adapted to the centre-mark on the cross-piece, as if the work were progressing on a perfect level.

Lands of less acclivity afford these outlets much more rarely, and sometimes none at all, in a large field. In such situations, were graduation of the ditches and furrows attempted, it would produce a

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* Library of Useful Knowledge: Farmer's Series, No. 12, p. 45, 1830.

† Agricultural Survey of Ayrshire, and of Dumfriesshire, Appendix p. 643.

very inconvenient and often unmanageable accumulation of water: or if the ditches and furrows were not very deep, an overflow would occur, sweeping every thing before it. This may be prevented, where rock abounds, by paving straight down-hill channels, as passages for the water. But, where rock is scarce—which is apt to be the case on such lands—I know no reliance so safe as that on furrows and ditches perfectly level. If these are accurately and deeply made, so that each spot of ground has charge only of the water which falls upon it, no ordinary shower can injure. But even in our heaviest falls of rain, should the bank in any given spot overflow, the water may have to traverse a considerable distance before it can acquire a further descent; and, as it is rapidity of current, in a direct descent, which produces gulleys, this mode of management offers the best preservative against them, in my knowledge. I have practised it successfully for many years, and, at my present residence, which I have occupied for eight years, I have obliterated hundreds of small gulleys, and many large ones, which had formed under the old mode of ploughing. It is true, that in a large field, two or three breaches may be found in the banks. This, however, is not ascribable to the mode of ploughing, but to a careless departure from it; and may readily be remedied, by moving the ditches at such places, a little higher up the hill; or, by forming dams across them, at suitable places, on each side of the breach, to stop the current of water tending that way. Indeed, such dams across the ditches might be advantageously made, by way of safeguard against the too great accumulation of water in one place, even where no breach has actually occurred. This would be in accordance with a plan proposed by a sensible writer in some number of the Register, of making dams, even across graduated ditches, in order to retain water from slight showers.

Having objected to the mode of operating with the rafter-level, that it is tedious, and believing that this difficulty deters multitudes from levelling at all, it becomes me to offer a substitute, which I know by experience to be more expeditious, and to answer the purpose well—at least on lands lying well. The implement which I have most commonly used, resembles in shape, a common pair of winding blades [or reel.] It has two horizontal cross-pieces, three feet long, at right angles to each other, firmly braced at the point of their intersection, on the head of a stout and strong upright staff, and accurately at right angles to it. This upright should be about five feet in length; its lower end should be sharpened, for sticking in the ground—a slit or mortice should be cut through it about two and a half feet long, exactly in the centre of which a silken cord should hang, with a small bullet at its lower end, immediately over a small pivot, or other mark indicating the centre of the staff, at the lower end of the mortice. A very thin piece of wood, or a piece of leather, should be fastened on one side of the mortice to keep off the wind from the plumb in levelling. With this implement, a brisk and intelligent overseer with two good assistants, after a little experience, may level an hundred acres of gently undulating land, in a day.

In operating, the leveller should station himself on a hill-side, and adjust the plumb of his level, near the head of a gulley—if there be one. One of his assistants should stand just above the head of the gulley, with a black staff or rod eight or nine feet long, with a strip of white paper tied around it, for an object for the leveller to *sight* at. The rod should be placed perpendicularly on the ground, and the paper made to range with the eye of the leveller, who looks over the cross-arms of the level. The bearer of the rod should then be sent on to another station. Another assistant should with a hoe, plainly mark the ground at each station of the rod-bearer and between them, carefully curving his line of marks, to suit the shape of the hill, to prevent angular ploughing, when he comes to guide the plough along his track. It is well, if the ploughman himself should carry the black staff, using the marker when he begins to plough the ditches, as a guide to his team. The leveller will be surprised to find how nearly to the same level the heads of all gulleys on a hill-side are located, when he traverses the hill on a level, near its brow. After making provision for ditching just above the heads of all the gulleys, so as to keep the water out of them, the operator may proceed to levelling the remainder of the field. This he may do, by going higher up, or lower down the hill as he likes, recollecting, that the level ditches will approach nearest each other, in the most precipitous land, and that of course, one of such places should be chosen, in which to start a new line of levelling. As it is important not to lose time in frequently adjusting the level, spots affording the widest range of vision, should be chosen for this purpose. These are commonly bottoms or ravines, with hills on each side. When necessary to change the station, the black rod may be set up at the mark last made with the hoe, and the paper moved up or down on it, to suit the sight over the arms of the level. This can be done much sooner than the level could be adjusted to suit the original height of the paper, and much time is saved by it. I have usually found it best very gradually to elevate the ditches a little above the level, around the heads of gulleys and bottoms. In doing this, I tie a number of strips of paper an inch or two apart, around the black rod, sighting at the one immediately below the hand of its bearer, directing him to elevate or depress his hand to suit me, as he changes his stations. A practised eye, however, can do this graduation tolerably without the aid of the papers.

The black rod may be dispensed with in clean land, and the operator may sight at the ground. But the work cannot be done so well, as clods and hillocks confuse the vision when sighting at a distance. In high weeds and broom-sedge the rod is indispensable. If the rod is made long, and the land is nearly level, the operator may save time by carrying on two marked lines from one station. To do this, he sights at a paper near the lower end of the rod for the line above him, and at one near its top for that below him.

There are several objections to this implement. It is very liable to be warped out of level by the sun and weather, and to be jostled or wrecked by the force requisite to drive its point into the ground. It should therefore be made as strong as possible, and of good timber, with the cross-pieces guarded, as well as possible, against warping. It will then do good work. A well made metallic one would be free from these objections, and would not be very

costly. If such cannot be procured, and wood must be used, I prefer an implement made in the following manner: Make a box, resembling the frame of a small table or wash-stand, without plank on its top, eighteen inches, or two feet across. Cover its sides two feet deep with thin light plank, to protect the plumb from the wind. The plumb should hang from the centre of intersection of two diagonal cross-pieces in the top of the box, and over a like centre of similar pieces in its bottom. This table or box may be supported by its own legs terminating in sharp iron spikes, to stick in the ground—or the legs may be fastened on with strong hinges, to be opened out in adjusting the level on uneven ground—or it may rest on a board supported by a three-legged staff (the legs moveable.) Whatever be its support, it should be tall enough to save the operator from the drudgery of stooping, while taking sight over its top, which should be exactly level and at right angles to its sides.

The mode of cutting the ditches can best be determined by each proprietor, who will be guided much by the nature of his land and his quantum of force. I have used a four-horse plough, but found after the ditches began to get deep, that so many horses encumbered each other. I prefer after marking off the track, with one steady horse, to complete the work with two, repeatedly running along the same furrows, until the ditch be wide and deep enough. The loose dirt should be drawn out of the first ditch cut, with hoes, while the plough is cutting others. This work may be performed by small hands.

It remains to be remarked, that the ditches, after they are made, should be used as guides in ploughing the beds next above and below each one of them, and that the ground left in the middle, after the beds parallel to the ditches, shall have, in some places, come together, should be thrown into short beds. This plan affords, as receptacles for the water, both the level ditches and furrows belonging to the beds. If the ploughman be skilful, he will need no assistance in forming beds parallel to the ditches. If unskilful, his horse must be guided by a stick, corresponding in length to the width of a bed, the other end of which is held before the breast of a boy, who walks in the guide-ditch or furrow. In this manner, the first furrow of each bed may be laid off, and the remainder of the ground ploughed by other ploughmen, or by the same one afterwards.

The foregoing minute details would doubtless appear very tedious, to the adept in levelling—for whom they were by no means written. The novice will probably not complain of particularity. They are submitted to the will of the editor.

M. N.

From the Proceedings of the Massachusetts Agricultural Society (December, 1834.)

BUTTER AND CHEESE.

To the Committee on Butter and Cheese of the Mass. Society for promoting Agriculture:—

My cows subsist entirely on grass in summer. I salt them three times per week. A little time before I turn them out to grass in the spring, I give one quart of cob meal to each per day. I give my rowen* to them when I first put them up to hay in autumn—think my rowen worth more at that season than in the spring.

Respecting the treatment of milk and cream. My milk is set in my cellar at a little distance from the cellar bottom. The cream should be separated from the milk when sweet and should be kept cool. I have a cellar 10 feet square and 9 feet deep in my cellar, where I put ice in hot weather, and there I can make my cream of a right temperature. I have a stove in my upper cellar, so that in cold weather my cream is also of a right temperature. I churn in summer three days in a week. The butter is taken from the churn as free from buttermilk as possible, then worked with the hand and salted. There can be no ladle to supply the place of the hand. The butter then stands an hour or an hour and a half, when the butter is worked until the buttermilk is entirely expressed; then it is ready to lump. Respecting salt, I always send for the best quality of butter salt; I do not know the name of it. If I get a lot that proves not to be of the best quality, I take it for other purposes, and send again for the best kind; for I think it a very essential thing to have the salt fine, white, and of a good flavor. The butter should be salted according to the taste of those who are to use it. There are a variety of tastes respecting the quantity of salt. I use no other substance in butter but salt. I think saltpetre a dangerous article in cheese, and should think it would have a bad effect on butter, though I do not know as I ever saw it tried. Respecting preserving butter in summer, the vessel should be thoroughly cleansed; and a little salt sprinkled over the inside of the vessel. It should be kept perfectly tight to prevent the air getting to the butter. When I have kept butter through the summer, I have put it down in white oak casks, and head them up until they were wanted for use; then unhead the casks and put on a lid. From my own experience I think white oak vessels the best for preserving butter, yet I wish for information from the committee and other gentlemen concerning this thing. Those who buy our butter can best judge what vessels are the best, and if the committee or the trustees of the Mass. Agricultural Society will take the trouble to satisfy themselves as to what vessels are best, and recommend them to the dairymen, it will be an advantage. Had I known of your exhibition soon enough I would have put up some in pots at the same time I put down in firkins, that you might have a chance to ascertain which is the better.

Gentlemen, I know you love good butter and cheese by your exertions in offering those liberal premiums, and as you have bestowed a good share of them on me, I feel myself under obligation to give all the information that I can to you. The dairymen want to get rich too fast; this is a great reason why you do not have better butter. At this season of the year the cream ought not to stand on the milk more than 12 hours in order to make good butter: of course we do not get but one half of the cream. There will rise another coat of cream, which may be applied to other uses

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*This name is given in England, and it is therefore supposed, also in Massachusetts, to the second growth of meadows, left to stand for grazing in the succeeding winter or spring.—Ed. Farm. Reg.

except for butter. It is a practice in all the dairies with which I am acquainted to get all the cream they can, and make all the butter they can, and get as good price as they can; but I see their mistake. Put a quantity of the second skimming of cream to that milk from which the first cream is taken, and it will make about as good cheese as four meal cheese; and I think by not trying to make so much butter, but a better quality, and a better quality of skim milk cheese, I saved enough the last year to pay my labor on my farm. You cannot expect so nice butter at this season as when we have fresh feed, yet you can see how little variation there is in my butter by that which I now offer for exhibition according to the Nos. beginning at the first. The butter in boxes was made by hay, and some of it of an ordinary quality, as I could not get at my best hay.

The management of cows is also an essential requisite for making good butter. The cows must be kept so as to be clean for milking, or the butter cannot be nice. Cleanliness and prompt attention to every thing are the indispensable requisites for making good butter.

LUTHER CHAMBERLAIN.

Extract from the report of the Committee.

The committee, after a careful examination, awarded the first premium to Mr. William Bachop, of Barnet, Vt. It was with some difficulty they decided between this lot and one offered by Luther Chamberlain, both of which were very prime. They based their final decision on the fact that Mr. Bachop's butter was equal, at least, to Mr. Chamberlain's, and, from the manner it was put down, appeared more likely to keep.—His dairy is supplied from twenty-one cows, kept in the usual manner, on grass in summer, and hay and grain in winter—the milk kept in tin pans, and churned every morning if the weather is warm—the butter-milk is removed by frequent washings in water, and four pounds salt and one pound sugar used for each hundred weight of butter—packed in wooden vessels, and set in a cool place.

The committee found no difficulty in awarding the second premium of $50 to Luther Chamberlain, of Westborough. The butter from this dairy has long been celebrated. Mr. C. seems to enter into the true object of this exhibition by furnishing a particular description of the manner in which it is manufactured. His letter, though long, is interesting, as coming from a practical man, and the committee think they need not apologize for inserting it entire.

The committee have inserted Mr. Chamberlain's letter at length, as a valuable exposition of the manner in which he makes butter, and as an example for others to follow. That he pursues the best course in its manufacture they can have but little doubt, and they feel certain that in attending as he does to quality, rather than to quantity, he secures at once both reputation and profit. No stronger proof can be given of this than the fact that his butter which took the second premium sold at auction for a higher price than that to which the committee awarded the first, which could only be accounted for by the fact that purchasers felt certain that in taking Mr. C.'s butter they obtained a first rate article, as he suffered none that was inferior to come from his dairy.

ON THE CAUSES TO WHICH THE RUST IN WHEAT IS ASCRIBED.

Brookfield, (Henrico) 8th Dec., 1834.

To the Editor of the Farmers' Register.

In the number of the Register for this month, is an article over the signature of "Medico Agriculturist," in which he has endeavored to point out the cause which produces the effect of rust on wheat and other plants. The many diseases which affect wheat and other grains, have engaged much of the attention of practical farmers and scientific men; and notwithstanding the diversity of opinion which has hitherto, and probably yet exists, as to the causes producing these diseases, it did not appear to me, until very lately, that the true causes have been discovered. In saying so, I would beg to refer "Medico" and your other readers, to an article in the October number of your Register for this year, copied from the Penny Magazine, entitled "Diseases of wheat," describing a number of highly interesting and scientific experiments by Francis Bauer, Esq., "on the smut balls or pepper brand," and "smut or dust brand," &c. The highly satisfactory nature of the result of these experiments, must, in my opinion, set aside all future doubts, as to the true causes of these diseases. Other writers on this important branch of vegetable pathology, have attributed the perfected disease, to a mass of parasitic fungi; but without tracing their origin. Amongst these I might mention Wildenow. Mr. Bauer himself, if I am not much mistaken, was at one time opposed to the theory which his own subsequent philosophic experiments, have so satisfactorily proved to be true; although, no mention is made in these experiments of the particular disease termed *rust*—(a disease which to my knowledge exists both in England and Scotland to as great, if not greater extent than it does in this country, at least so far as my observation has led me.) I am of the decided opinion, that this disease is also produced by a similar cause as in the above mentioned diseases—and that the appearance on wheat and other grains termed rust, is a collection of extremely minute fungi, whose seeds are propelled by the rising sap in the same way as are the seeds of the "uredo fœtida" and "uredo segetum," as described by Mr. Bauer. But should the true cause of rust be the flow of juices, as maintained by "Medico," I am inclined to believe that the effect is produced, not by an overabundance of sap in the "supplying organs," but by a very opposite extreme. By a careful examination of a stalk of wheat on which there is rust, it will be found that the root is diseased: hence I am led to conclude, that the vital principle, or propelling power is weakened, and that the plant, in consequence of the diseased state of the root, is unable to absorb a sufficient quantity of sap to give the necessary vigor to the propelling power; and that after the return of the cambium or proper juices from the elaborating organs, there is not sufficient power to propel it into the finer organs of the parts of fructification—at which part of the plant, an accumulation of the cambium takes place, and by shortly getting in a morbid state, it infects the internal parts of the stalk, and subsequently penetrates the epidermis, and causes the flow of juices, which by induration and exposure to the air might assume the appearance of rust.

As to the diseases which affect vegetating cotton or tobacco, I have had no opportunity for observation, but the "black spongy formation," sometimes to be found in the ear of corn, which "Medico" alludes to as being also the effect of a flow of juices, is so much like the disease in wheat and other small grains, called "smut, or dust brand," and clearly proved by Mr. Bauer to be caused by the seed of the *uredo segetum*, that I have no doubt this disease in corn originates in the same way—and that the "black spongy appearance" is also a mass of fungi. There is one peculiarity which I have observed on the stalks of corn affected by this disease—which is, that the leaves, though they maintain their general color, show evident symptoms of disease. They will in most cases, be found to have become shrivelled in many places, which I think, indicates the existence of some substance, propelled through the coarser organs for the ascent of the sap—and which meets with some resistance in the finer organs of the elaborating portion of the plant, as no external injury is discernible.

The remedy pointed out by "Medico," is one, even allowing his theory to be true, which I believe few farmers would be willing to adopt: the cure in this case would be much more injurious to the farmers' interest than the disease itself. The experiments of Mr. Bauer fully prove, that to steep seed grain in lime-water for a proper length of time (twelve hours,) effectually destroys the seeds of these minute fungi, and I have no doubt would also prevent rust. Washing seed grain in lime-water, has long been the practice of many farmers; but not being allowed to steep for any length of time, the benefit as might be anticipated, was very partial. If soils containing the seeds of these fungi were manured with lime in addition to steeping, the seed in its solution, an additional benefit might be derived.

I hope that "Medico" will attribute the above remarks to the existence of the same feeling which I consider as having prompted his—a sincere desire to promote the best interests of agriculture, whose prosperity is the bulwark of any nation. It must be gratifying to every practical agriculturist to observe, that men filling influential and learned professions in society, and who, from their general education and scientific acquirements, are well qualified to aid them in the more scientific, but not less necessary part of their profession, come forward and present such investigations, with that object in view. There is yet room for many *Oberlins*.

A. N.

[We are much gratified in being enabled to present the following information from a very intelligent and practical farmer of Pennsylvania. Several previous efforts to learn what means were used to crush or grind bones, which had been requested by correspondents, had been made without success. It will be seen from Dr. Gibbon's letter, that bones very coarsely broken serve well—and that without any mill, or machinery, other than heavy hammers, or old axes, bones may be prepared on every farm for use. Every farmer in the country may then make a limited use of this very rich manure—and some near towns, may obtain considerable quantities where the carcasses of dead animals are thrown, and from various other sources still more abundant.

The mill described below as serving for crushing bones, and also for corn with the cobs, may be obtained for about $60. Such a one, (worked by two horses) is used both for crushing corn and gypsum, by George E. Harrison, of Brandon.]

ON THE MANNER OF PREPARING AND APPLYING BONE MANURE.

To the Editor of the Farmers' Register.

Petersburg, Va., January 16th, 1835.

You inform me you wish to know something of the mode of breaking or crushing bones, so that they may be applied to the purposes of agriculture; and of the general method of using them on the land. I can offer you some details with respect to this important manure, as it is much used in a certain part of the county of Philadelphia.

The first purchase I made, was from a man who had been induced by some reading farmer to grind up the coarse knuckle bones and offal slips, the *refuse* of the button makers, in a machine worked by two horses, and formed very much like a large coffee mill—which was afterwards employed to grind Indian corn, with the cobs, for horse feed. I have seen another kind, something like a cider mill, (but attached to a water-power) with horizontal iron notched rollers, which I understood was similar to those generally used for the same purpose in England, where there are bone mills in all the principal agricultural districts, supplied from the continent with large quantities of "raw material," gathered from the battle fields of Europe. The trade in bones was thought so important some years ago, that an objection was made in the British House of Lords, to the number of foreign vessels engaged in this active commerce. It may be well to state, that our ability to obtain a large quantity of bones for manure in the neighborhood of Philadelphia, depends very much upon different manufactories established there for making buttons, tooth brushes, umbrella and cane handles, &c. &c., which have very much increased since the duty of 33⅓ per cent. upon the importation of these articles from abroad—which creating a demand for the large round bones of the shoulders and thighs of cattle, has caused a great advance in their value here. These bones rose from 6 dollars to 24 and 30 dollars per thousand bones: the leg bones being smaller, are sold for lower rates. I know an enterprising manufacturer in our county, who made a very handsome profit by picking up a large quantity of bones, suited to his purpose, near several of the towns in Virginia, where cattle are slaughtered and salted for the shipping—although he had them barrelled, and paid the same freight as for flour, transporting them in the steam boat.

I recollect one large establishment for making buttons, in which the machinery was worked by steam, and a number of hands were employed, where the *refuse*, or offal bones, amounted to three cart loads in a week. The large ends were cut off by circular saws, which also divided the barrel of the bones into thin slips, out of which the buttons were cut. I contracted to purchase all the offal bones, and bone dust formed by the saws, at $1 25 per cart load, and had several thousand bush-

els hauled a distance of twelve miles for manure. For ground bones I paid at first ten cents per heaped bushel; and for the rough large knuckles and *refuse*, five cents per bushel; afterwards nine and twelve cents per bushel. They are now higher from an increased demand. The practical chemists also employ them to form ivory black, and I believe, ammonia.

Before the manufacturers receive the bones, they are usually boiled to obtain their oil. This is employed to oil leather, grease cart wheels, and to form soap. A very *fat* Englishman was one of the first to introduce this process. He induced the butchers' boys to collect all the bones, instead of throwing them into the street; and every market day he hauled them away in a cart to his place of deposite. The first operation was performed by pigs—who ate any meat or fat adhering to the bones. They were then boiled and assorted—the perfect, large bones, being sold to the various manufacturers; and the rest to the chemists for ivory black, or to farmers for manure. As this man's business increased, his neighbors began to complain of the ill odor of his premises—and finding him insensible to their remonstrances, he was indicted for a nuisance, and his establishment declared prejudicial to the public health. Being himself, and also his wife and children, remarkably stout, ruddy, and well conditioned—although sleeping, eating, and living in the midst of a very offensive atmosphere, from animal decomposition—he was shrewdly advised by his lawyer, to make no other defence, than by arraying his family opposite the jury, and coolly appealing to their good sense, to declare him guiltless—which they did: but he wisely moved further out of town, to avoid giving further offence in the same neighborhood. This man often made contracts with the manufacturers he supplied with whole bones, to take the refuse; which he sold to the farmers mixed with the offal of his own establishment. He has made a small fortune, and retired to a farm well manured with bones.

The ground bones are applied to wheat, rye, barley, potatoes, buckwheat, and grass crops, with great advantage—but I do not think they benefit Indian corn as much, in proportion, as the others. White clover, Swedish and other turnips, and millet, are very luxuriant after the use of bones. The coarse large bones are scattered about without being broken, and ploughed under the ground. They are sometimes inconvenient, but I think equally active as the ground bones, if not more so, as they generally contain more fatty or oily matter. During the growth of a crop, the fibres of the plants will be found filling every crevice of the bone, as if eagerly seeking the most desirable nourishment. I have applied 150 bushels per acre, which I think too much; from 60 to 100 bushels, I believe the proper medium. Their effects are said to last a great number of years—and they certainly combine within themselves, the most valuable properties. In the upper part of the county of Philadelphia, not far from the Delaware, bone manure is very highly regarded, well known, and much sought after. The large bones about a farm are, by one very careful farmer I know, gathered together and broken up of rainy days, or at odd times; forming within a year, an important addition to the amount of manure.

The method of applying the bones to land, is not much varied—sometimes they are cast abroad before the land is ploughed—occasionally the ground is ploughed and rolled and the bones spread upon it, and ploughed in. Great care is essential in spreading, to divide and scatter this manure equally. An undue proportion in one spot will cause the grain to fall. Where the bones have been placed in heaps, the earth should be shovelled up closely and well spread—or the straw will be too rank, and fall without yielding grain. The button manufacturer, of whom I have written above, moved to New York, where he thought there was a more abundant supply of bones, through the canals from the west; for they are now a regular article of traffic—and this manufacture adds an item of profit to those who barrel beef and raise cattle. The large bones, if left under ground a few years when the land is in grass, will be found gradually to loosen, and disunite at their sutures—after vegetation has consumed the fatty particles, the periosteum or membrane covering the outside of the bone, and the membranes lining all the private cavities, disappear. The earthy particles remain united, but are constantly yielding to the action of decomposition, and mechanical divisions.

Bone dust, or roughly broken bones, form an excellent application for gardens. But although they contain so large a quantity of lime, and are immediate in their operation, they do not interdict the use of other manures, or of lime. The intermingling of a variety of substances, appears to afford the most acceptable sustenance to vegetables. The spontaneous growth of white clover is very much assisted, and its size and vigor increased, by the application of bones: and I think the amount of potatoes on a field in which only a part was boned, (the whole having been otherwise manured) was fully two-thirds more on the part boned, all other things being alike, than on that portion where there were no bones.

There are always lying about farms, valleys, towns, and water courses, a number of bones of different kinds, which are unsightly, noisome, and useless in their abandoned condition, and which would be well worth the attention of some of your active farmers. The gathering of them would be found much more profitable than many may conceive, who have never witnessed the results of their judicious application to the land.

I write you this desultory account, without any notes to assist my memory, and beg you to receive the hasty sketch, as an offering of my good intention. After viewing many of the marl deposites along the shores of James River, and seeing the results of animal matter connected with them, I am inclined to believe you have near your doors, substances which will be found to approach in efficacy, the effects of the manure I have given you an account of.

J. H. GIBBON.

P. S. The most prompt growth I ever saw, was a hedge manured by laying cows' horns, horses' heads, pigs' jowls, and other uncouth bones, in a furrow opened by the plough, and covered in by the same process. Upon this line the hedge was planted, and grew rapidly and healthfully.

I forgot to notice some other manufactures

which also supply farmers, in their vicinity, with manures which may be novel to you. The *refuse*, or oil cake remaining after the expression of castor oil, has been used for wheat with very good effect. The bristles from the brush makers are also valued, and hauled many miles from town by the market wagons. The shavings and raspings from the comb makers are also thought equal to the bone manure by some. The horns of cattle are first cut, then softened, and finally pressed between heated plates of iron, and afterwards manufactured into combs of various shapes, and in very large quantity. Nuisances are thus converted into profitable conveniences, and yield capital and employment to many branches of industry, extensively useful.

For the Farmers' Register.

HOGS—LEGISLATORS—MANURE MAKING.

If it be true that "our country expects that every man will do his duty," it is time that my mite was thrown into the general treasury. Small as it is, I am encouraged by the recollection that this great globe itself is made up of particles, or atoms. If your numerous subscribers would only contribute each a small matter, having a strict reference to that which is practical, it would soon amount to valuable matter; for as "iron sharpeneth iron, so doth the wit of one man sharpen another." Had the poor widow been restrained by pride, the most beautiful illustration in the scriptures would have been wanting. Let me therefore beg that all your subscribers will show a willingness to aid you—for in this they will contribute to regenerate and rebuild our wasted country. It is time that every man who really feels for the state should show it practically. My soul is sick with *stump* and *barrel* love of country. Away with it—and let us rally around our country, and those who show their love by their fruits. My brother farmers may rest assured that "grapes are not gathered from thorns, or figs from thistles." A man will exert his best powers for his own family: it is there you can measure his talents, for you have his house and farm before you. I claim to be excused for those remarks, because I believe that the ruin of our state proceeded from stump and barrel legislators; for they "knew not what they did," else how could it be that the beasts of the field have rights and privileges that are not accorded to the owner? How could it be that the protection of the law was not given as fully to one kind of property as another? Why not subject the hog to the same rules and restraints as his master?

I was making extensive preparations for creating manure when the great snow came upon us. Ditch mud, and every kind of good earth I can get, is carted into the farm yard, with occasional dressings of lime. The whole mass will be carefully incorporated, and taken out upon grass or corn land in the spring. In this way, much land may be improved; but the cost will not fall short of five or six dollars per acre—for I have my oyster shells to haul seven miles. Some of my friends have been experimenting with stone lime, brought from the north; and I have every reason to believe that thirty bushels to the acre has doubled the crop of corn. If so, mother earth will pay her debt thus created, and have a surplus fund besides. I hope we shall fall upon some practical mode of improving our Fairfax land, for if we do not, better would it have been that we never had been born.

JEREMIAH.

January 2nd, 1835.

GENERAL TOPICS CONNECTED WITH AGRICULTURE—AGRICULTURAL SOCIETIES, &c.

To the Editor of the Farmers' Register.

He who now doubts the beneficial influence of the Farmer's Register, is either an inattentive observer of passing events, or incapable of tracing obvious effects to their proper causes. I do not mean that any general defective system has been demolished, and one of greater perfection erected on its ruins; but simply that a spirit of interest and inquiry has been awakened, which must necessarily lead to desirable and profitable results. Were I challenged to adduce the proof, I would scarcely care to point beyond the recent formation of agricultural societies in different counties of our state. Many lugubrious reflections have been communicated concerning the suffering condition of agriculture; indeed the multitude of surrounding evidences is calculated to arouse from lethargy every patriot and philanthropist. We need only refer to the astonishing number of our citizens who are continually forsaking in despair, their patrimonial possessions, to seek a brighter destiny in the wilds of the west. The halls of some of our literary institutions furnish additional evidence, so plain that "he who runs may read." We see that although their professorships have been increased, their facilities multiplied, and discipline improved —scanty ranks and diminishing numbers assail their interests, and threaten to paralize their usefulness. Under these circumstances I do not come forward in the spirit of empiricism, to propose the establishment of agricultural societies as a panacea for all the evils under which we labor, but merely to recommend their encouragement as the easiest, and, as far as it goes, the most efficacious remedy within our reach. Various other means have been suggested to effect the same object, generally however, either involving considerable expense, or an *immediate* departure from customs which have descended with our patrimonies. Am I too sanguine in the anticipation that these same results would be more likely to flow, from the source to which I have referred? I am particularly desirous to avoid any imputation of vanity, by inculcating any particular system of management, or by offering any specific substitute. I can only wish I were equal to the task—but in considering the disproportion between the magnitude of the object and the extent of my abilities, I am appalled at the arrogance of the attempt; and shrink from a responsibility I feel so little able to sustain. But a firm conviction that the establishment of agricultural societies is connected with the best interests of our country, and that its destinies are too seriously threatened to justify apathy, or to excuse silence, has impelled me to introduce to your notice the plan I zealously, but feebly, advocate. As long as the towering forest waved its lofty head over the extensive regions of fertile soil, the agriculturist was scarcely expected to turn from a prospect so inviting, to view and re-

pair the ravages of injudicious cultivation; but the want of new land, must now either turn our attention to the improvement of the old, or throw us into the current of emigration which is carrying from our state many of its choice and most valuable citizens. One who feels an honest pride for the land of his nativity, and expects in "weal or woe" to connect his destiny with hers, views this alternative with emotions of the deepest solicitude. The God of Nature did not give us a fertile soil and climate calculated to "quicken into life the products of the temperate zone and fruits of the tropics," thus to be abused, neglected, and abandoned. Without any of those calamities which have withstood the prosperity of nations, in a period of profound peace, under the operation of a government regarded as the most benign, and institutions the most salutary, the patriot is not yet left without hope. Something is only wanting to infuse a spirit of interest in the breasts of the farmers themselves, and concentrate their energies. If there be any occupation which requires "singleness of object, and firmness of purpose," surely it is theirs. But only let it be announced that a president is to be glorified, or the measures of his administration denounced by some political aspirant, and we see the steril field, yielding but a scanty support to a suffering family, with the closest attention, readily and eagerly abondoned for the bustle and confusion of the courtyard. Perhaps very unsatisfactory answers would be given to the inquiry, what had been gained by the exchange? I am far, very far from wishing to curtail the rights of freemen, or objecting to the exercise of them—and only wish to show that objects of minor importance are eagerly attended to, while those of paramount consideration are entirely neglected. Had the meeting of an agricultural society been the scene of resort, perhaps some interesting and instructive essay on the proper method of making and applying manures, would have increased the beauty and productiveness of his farm. He might probably have seen some cheap and durable machine greatly curtailing manual labor—or different specimens of live stock, convincing him that particular breeds of each can be most profitably raised. Sufficient inducement is only wanting to bring any kind of stock into the country its interest may require. He might have learned that clover seed which cost him 7 or 8 dollars per bushel in the winter, could have been purchased in summer for $3 50 cents —thus obviating one formidable obstacle to its general introduction; or, by the wonderful product of some acre of ground in corn, wheat, tobacco, or some other agricultural production, his cultivation of the article might be greatly improved. And even if none of these anticipations could be realized, he would find sufficient recompense in the cultivation of that social intercourse amongst his fellow farmers, so well calculated to lessen the acerbity of party rancor. The expense of this plan certainly cannot be urged as an objection, as few would complain of the annual contribution of 2 or 3 dollars, when it is to form premiums, which would be so diversified as to allow any person cultivating a farm, or engaged in any species of mechanical business, to come into fair competition.

I have thus, Mr. editor, followed the current of my reflections in delineating a few of the advantages which would result from the formation of agricultural societies. The subject is inexhaustible, and one which widens and expands with the progress of discussion; but I fear my desultory remarks has already caused you to regret the kind offer of your columns for original communications. Should the proposed plan be objectionable, there is not an individual in the whole community, who would hail the annunciation of an acceptable one with more applause than the humble propounder of this.

SHENSTONE.

Nottoway, Nov. 16, 1834.

From the Whig.

CANAL AND RAILWAY CARRIAGE OF HOGS.

Messrs. Editors.—This being the *pork-killing* season of the year, and what you and I know, to our cost, the *pork-buying* season also, the human mind seems naturally, if not vitally, turned to that subject.

We all know that the states of Maryland and Virginia, as well as North Carolina, below the Blue Ridge, are the *pork-buying* sections; whilst the parts of those states west of the Blue Ridge, together with Tennessee, Kentucky, Indiana and Ohio, are the *pork-selling* sections, to supply that vacuum—"*Hiatus maxime deflendus.*"

I know not how it is with you, but with me, $5 50 per 100 lbs. for pork, renders this a *killing-season* in more senses than one; and I have been casting about to see how we might get that article a little cheaper.

I have supposed, that so far as Ohio, Indiana, Kentucky and the Ohio parts of Virginia are concerned, if steamboats with fixtures to hold hogs, were introduced into use, the hogs of those sections might be cheaply transported, with corn obtained at cheap rates, to feed them to the Falls of Kanawha; and when that river shall be improved, as sustained by our friend, Joseph C. Cabell, (that *true* friend of the state, and of *true* state rights,) and the improvement carried through by a rail road to Covington, that they could be transported on that, with corn to feed them to that place; and if met there by canal navigation, could again go on, *corn and all*, in boats fixed for the purpose, to Lynchburg. From this place, they would proceed, *corn and all again*, to Richmond; or, leaving the canal, and disposing of their surplus corn now brought to the best market, seek a similar market for their hogs, on each side of the river.

To excite more attention to this subject, as well as to see whether *this trade* might not be fairly *valued* on as a source of profit to the James River and Kanawha Company, should the residue of that stock be taken (as *surely it will*, either by individuals or by the state,) I have endeavored, but without assistance from any one understanding the business, to draw a comparison between the expenses of transporting that trade, by the improvements above indicated, and the expense of driving the animals, in the present way, to market.

I wish some one, acquainted with the subject, would examine my estimates, and see wherein, and to what extent, I have erred, on either side, as well as give us some estimate of the probable forage of live stock, that might pass on the improvements proposed. My idea is, that it would be very great, and at such a rate as would enable the sellers to reduce the present prices.

Suppose 500 hogs, weighing 50 tons, transported on rail road cars, at 3 cents per ton per mile, (it would cost, I believe, less by boats,) this part of the expense for 100 miles would be, say		$150 00
Suppose, including all delays, it takes 1½ days per 100 miles—the support of the hogs will be say 8 barrels of corn per day—this laid in where it is cheap, with its transportation, will cost, say $1 75 per barrel throughout the line,		21 00
Transportation of the owner and one attendant or feeder, at 4 cents per mile, cost	$8 00	
Board of owner 1½ days, say	1 50	
Do. of his driver and his wages, say	1 00	
Do. his passage back, say,	4 50	
		15 00
		$186 00
But the hogs being at rest, and well fed, will have increased in weight, instead of losing by driving, say only ½ lb. each for every 1½ days they are so treated—say 250 lbs. at 5½ cents, is		13 75
		172 25

In the other way.

Expense of driving the same distance, supposing it can be done in 16 days, which is more than 16 miles per day:	
Feeding for 16 days, 8 barrels per day, supposing it can be had on the journey at the average cost of $2 50 per barrel.	$320 00
Five drivers, at 60 cts. per day for wages, and finding,	48 00
Same for 4 days returning,	12 00
Owner's expenses, for self and horse, $1 50 per day,	24 00
Loss in weight of hogs in driving 16 days, and the risk of losing some of them—put this down only at 6 lbs. to each hog, makes 3000 lbs. at 5½ cents.	165 00
	569 00
Suppose the average distance in travelling from the west to an eastern market is 500 miles, the cost in driving 500 hogs would be,	2,845 00
The cost by steamboats, canal boats, and a rail road at 3 cents per ton per mile, would be, say,	861 75
Difference,	$1,983 25

This, of itself, would be a good profit on 500 hogs, and would enable the seller to reduce the price from $5 50 to 3 50, or at most $4 00 per 100 lbs.

A. B.

[The following extracts present all those portions of a much larger article, which will be generally interesting to readers in this country. The parts omitted merely furnish descriptions of particular lines of railway contemplated in England, and a general view of such improvements in Europe and America. The facts stated in this review, (which seem to be unquestionable,) will serve to direct our attention to various sources of profit to our own projected railways, which have been scarcely thought of heretofore—and perhaps, may lessen, if not remove, the objections of many land holders to those improvements. The actual increase in the value of lands on the routes exceeding the anticipated increase—the vast increase of travellers caused by the reduction of expense and of time—the facilities for conveying live-stock—all are matters which apply with as much force to one or both of the two great improvements proposed to end at Richmond, as to the English railways referred to by the reviewer.]

From the Edinburgh Review.

IMPROVEMENTS IN INLAND TRANSPORT IN ENGLAND.

It is now two years since we called the attention of our readers to the great advancement which had been made in the art of applying steam-power to the important purposes of inland transport. We then foretold the rapid extension of this great instrument of social improvement; and subsequent events have amply verified our predictions. Rail road undertakings have been entered into with an avidity to satisfy the most ardent, and to create alarm in the more timid and cautious. In our own country, however, the number of checks on such schemes are sufficient to prevent the public from rushing into them with undue precipitation; and the danger rather is, that private and local interests may act as too great a drag on public enterprise, than that the latter principle should receive undue scope. A considerable portion of the property of the country, and more especially of that in land, has, in many instances, opposed serious obstructions to parties seeking legislative sanction for projected lines of rail road; and although, in some cases, such opposition has proceeded from sinister motives, or such as would not bear an open avowal, yet we must suppose that in the majority, the ostensible objections have been seriously and sincerely, though erroneously entertained. In the present article, we shall endeavor to show, not only that the principal objections so urged are unfounded in themselves, but that they are in direct opposition to the results of experience, and as much opposed to the real interests of the objectors as to the public good. We shall also briefly advert to the principal lines of communication recently undertaken, and to those which are in progress in other parts of Europe, and in America.

The opposition which railway companies experience in obtaining the necessary legislative sanction, proceeds, in the majority of cases, from the land holders, through whose lands the projected lines are to pass. Nevertheless it is demonstrable, that there exists no class of persons whose interests are more likely to be promoted by such improvements than those of the local proprietors. One ground of objection assumed by proprietors resident in the vicinity of projected lines of rail road, is the apprehended nuisance of the noise and smoke of the engines, and of the exposure of their premises to the intrusion of large numbers of passengers. The evidence produced before the committee of the House of Commons, on the London and Birmingham Rail Road, will show how unfounded are such objections.

Mr. Hardman Earle, a Liverpool merchant, was one of the most determined opponents of the Liverpool and Manchester Rail Road. His family had, at the cost of above £12,000 built a house, and laid out pleasure-grounds, through which the line of railway passes; and their opposition was founded partly on the apprehended injury and inconveniences arising from this circumstance. Mr. Earle, therefore, was very properly summoned as a witness before this committee, and the following is a part of his testimony.

'Have you experienced any inconvenience since the railway was constructed?—No inconvenience whatever has been experienced.

'Are the grounds infested by the people in consequence of the passage of the locomotive engine—No.

'Is there anything offensive in it?—Nothing whatever.

'Is there any smoke?—None whatever.

'Is there any noise?—No; it is rather an object of interest to persons residing there.

'Are you able to say whether the inhabitants of other houses are annoyed?—I am enabled to say they do not consider them a nuisance.

'At the commencement of the undertaking were you a determined opponent to the measure?—Yes; my mother was a petitioner against the bill, and I appeared as evidence against it.

'From all that you have since seen you would no longer oppose the construction of rail roads?—Certainly not; from what I have seen my opinion is entirely changed.'

In fact the fuel burned is coke, which produces no smoke. The smoothness of the road, and its freedom from those asperities which exist on the best constructed turnpike roads, are such that the wheels move with comparatively little noise. But, in addition to this, the speed being almost three times that of common coaches, and more than seven times that of wagons, the noise is almost momentary. A train of wagons or coaches shoots pass with the speed of the wind, and the noise is scarcely perceived before it ceases; it cannot be heard on a still day at a greater distance than one hundred yards.

Another ground of objection, urged by landlords, is the apprehended depreciation of the value of the adjacent land. The facility of communication with the metropolis and populous towns is so obvious an advantage, that we cannot help expressing our astonishment that such an apprehension should for a moment be entertained. As those who could entertain an objection so unfounded are little likely to be accessible to the reasoning by which it might be refuted, we shall here confine ourselves to facts, and show that in every case, without a single exception, which has come under inquiry, the value of land adjacent to a successful line of railway has been considerably increased.

Mr. Pease, M. P., a director of the Stockton and Darlington railway, stated in his evidence, that he had been for ten years a director of that company, during seven years of which the rail road had been in practical operation; that he had closely observed its effects on landed property through which it passed, or which was adjacent to it, and that he had been privy to all the negotiations which had taken place between the rail road company and the proprietors from whom they had made purchases.

'Do you know whether the advertisements of letting farms or selling estates, contain any thing relating to the rail road?—It is invariably stated, either that the rail road passes through the estate or near to it; they consider it as an enhancement of the value of the property.

'Are you a land holder yourself in the neighborhood of the rail road?—I have one small estate, which it intersects into two equal parts nearly. It passes through the enclosure in which the homestead stands.

'Have you been benefited by the rail road passing through it?—I have; the cuttings are available as drains; the rent of the property is increased one-fifth. I let the farm, subject to its being given up on the rail road being made, and I have since received one-fifth additional rent.

'Do you know any instance of the reduction of rent, in consequence of a rail road passing through a farm?—I have made inquiries, but have not been able to meet with such an instance.'

The Stockton and Darlington railway was originally intended to be a single line; but after its formation the company found, from the extent of traffic upon it, that a double line would be necessary. Having originally purchased no more land than was necessary for the single line, they were obliged to treat with the same proprietors for an additional tract to widen the road, so as to receive the second line of railway. Nothing can more conclusively decide the question of the effect of the railway on the value of land than this circumstance. Here was a portion of land, purchased before any railway had been constructed; and an equal quantity, in precisely the same place, was subsequently purchased from the same parties by the same company, after the formation of the single line of railway. Mr. Pease was examined as to the terms on which the second portion of land was purchased.

'Have you paid on those (second) treaties, an increased value upon the land beyond what you paid before the line was established?—Invariably.

'Can you say to what amount?—I should say that we have never objected to pay an advanced price of 50 per cent.

'Was this in consequence of the increase of value arising from the rail road?—We were quite aware of the increased value to the owner, and made no objection to the advance.'

Mr. Thomas Lee, a surveyor and agent to several landed gentlemen in the neighborhood of the Liverpool and Manchester Rail Road, was examined as to the effect of the rail road upon the value of land in that neighborhood.

'Can you tell the committee whether in an agricultural point of view, property has been improved or deteriorated by the rail road passing through it?—It has been improved.

'Have the farmers been benefited by it?—They have.

'Have Colonel Lee and Mr. Trafford obtained higher rents in consequence of it?—They have.

'Have you taken land yourself at an increased rent?—At double the original rent.'

Mr. Hardman Earle, before mentioned, was examined to the same point.

'Do you know any instance in which the value of land has been affected by the railway?—I think the Chat Moss was an instance of that kind. They bring manure from Manchester to Chat Moss; and wherever a station is formed, the value of the land is improved. You see advertisements recommending a site, because the rail road runs near or through it.

'Do you know of any instances by which land has been depreciated by it?—I think I can say positively that there is not an instance on the Manchester line.

'Do you know of any person quitting their dwelling-houses in consequence of it?—I do not know of one. I should be glad to purchase land on the line, to build for myself.'

We may here state that the Chat Moss is an extensive district of bog and morass, over which the rail road was carried at incredible labor and expense. It was of course previously altogether unproductive. We now, however, see on each side of the road extensive systems of drains, gradually carrying off the water, and leaving tracts of considerable fertility. There is no doubt that within a very short period the whole of this morass will be transformed into a fertile tract of arable land.

Another ground of objection, is the injury likely to be produced to turnpike trusts. Even if the truth of this objection be admitted, it is not one of sufficient force to warrant the sacrifice of public benefit. A turnpike trust is, or ought to be, held only for the public good; and if it should be affected by the establishment of a rail road, this would only prove that the one was found more beneficial than the other. But it is a curious fact, that this apprehended injury has not (at least in every instance) ensued. The Stockton and Darlington railway furnishes a remarkable example to the contrary.

Mr. Pease states in his evidence that the turnpike roads in the neighborhood of that railway have been improved since its construction.

'Has there been any advantage derived to the roads in the neighborhood?—I consider that they are all of them in a much better state of repair, and that their funds are improved; I do not know a single exception.

'Do you know the road from Stockton to Barnard Castle?—Perfectly well; I have been a commissioner In that trust there are two roads running nearly parallel with the rail road, and a third intersected by it.

'Were the trustees of these roads petitioners against the bill?—All of them.

'On what grounds did they oppose it?—That the money borrowed on mortgage was hazarded by the rail road.

'Have their fears been realized?—No; the funds in all cases are improved.

'You state that of your own knowledge?—Yes, as an acting commissioner.'

The advantages likely to arise to agricultural producers from the facilities of conveying their produce to market, as well as the reciprocal advantages derived by the consumers, were rendered apparent by the evidence of several farmers and graziers, and also of metropolitan butchers.

Mr. W. Meade Warner, an extensive farmer residing in Oxfordshire, stated, that he considered that if the rail road now proposed to be carried from London to Birmingham had been formed ten or fifteen years ago, it would have produced him an advantage of not less than fifty pounds a year. He considered that the whole system of farming grass land would undergo a change, owing to the new capabilities which would be conferred upon it, by the speed, certainty, and cheapness of the communication with the market. A different kind of produce, of a much better and more profitable quality, would be obtained from it.

'Are lambs sent to London from your neighborhood?—They are, principally on the road; but when too young to leave the mother for so many days as the road requires, they are sent by wagons. Not many, however, are sent by this way.

'Are you prevented from sending many lambs to market by the difficulties of the road?—We cannot send them so young as we would otherwise send them. It is of importance to send them early in the season, as the ewe would feed off earlier.

'If a rail road were established, would they be sent by you and the other farmers by that means?—No doubt of it.

'Do the same observations apply to calves as to lambs?—Exactly.

'Are the cattle much injured by being driven up?—Very much; incalculably.'

It is not merely views of policy that should lead us to seek for some improvement in the transport of cattle to the markets. The following evidence is addressed to the feelings of common humanity.

'Supposing that even the cost was increased of sending them by the rail road, would it be of advantage to the farmer to have them conveyed by that means, nevertheless, instead of driving them in the ordinary way?—Certainly; it would be a great advantage. Sometimes the poor things are driven till their feet are sore; and the effect of that is, that they are sold on the road for what they can get. It is often the case, that they drive many of them till they have not a foot to stand on.

'What price, in your opinion, would the farmer be willing to pay for the conveyance of his cattle to London by the rail road, instead of the present way?—If I paid double, I should still be a very great gainer. It is a very important thing in the saving of beasts and sheep, both as to the exposure and the nuisance they create on the public roads. Besides that, the cruelty and injury to the animals is beyond all belief.

'Do I understand you rightly, that you would prefer to pay fourteen shillings for transmitting your cattle by rail road, to paying seven shillings for the ordinary means of conveyance?—To be sure I should.'

Mr. Charles Whitworth, a very extensive farmer in Northamptonshire, was examined on the same points. He had seen cattle conveyed on the Manchester Rail Road, and stated that they came from the journey 'as fresh as if they were just off the field.' He stated, that in order to send the lambs to market, it was necessary to send the ewes a part of the way with them; and 'even then they were much injured before they reached London.'

The injury sustained by cattle coming to the London market, was further proved by Mr. John Sharp, an extensive butcher, residing in Mary-le-bone. He stated that he has been for forty years established as a butcher, and that he never failed to observe more or less injury sustained by cattle driven from a distance to London; that their value was considerably lessened, owing to the inferior quality of the meat, arising from the animal being slaughtered in a diseased state; that the animal being fatigued and over-driven, 'becomes feverish, and his looks become not so good, and he loses weight by the length of the journey and the fatigue.' He stated further, that even steam-vessels, where they could be resorted to, did not altogether remove this objection. Cattle come from Scotland by steam-vessels, and they are found in London to be in an unnatural state: 'they seem stupified, and in a state of suffering from fatigue.'

It is not merely the fatigue of travelling which injures the animal, but also the absence from its accustomed pasture. Mr. Sharp stated that the injury from this cause was more or less under different circumstances, but always considerable. In order to obviate this, a considerable portion of the meat supplied to the London market is slaughtered in the country, and it comes in this state, in winter, from distances round London to the extent of one hundred miles. In warm weather a large quantity of it is spoiled, and a still greater quantity is deteriorated by this mode of conveyance. The transport of calves and lambs from a distance greater than thirty miles, is altogether impracticable; and even from that distance is attended with difficulty and injury. To convey these and other live cattle from a great distance, not only speed, but evenness of motion, is indispensable. Now these two requisites cannot be combined by any other means than the application of steam-engines upon a rail road.

From the whole of the evidence, the fact appears to be indisputably established, that the supply of animal food to the metropolis is not only defective in quantity, but that it is of unwholesome quality—comparatively, at least, with what it might be, if the tract from which it could be supplied were rendered more extensive. But forcibly as the evidence bears on this species of agricultural produce, it is still stronger respecting the produce of the dairy and the garden. Milk, cream, and fresh butter, vegetables of every denomination, and certain descriptions of fruit, are supplied exclusively from a narrow annulus of soil, which circumscribes the skirts of the metropolis. Every artificial expedient is resorted to, in order to extort from this limited portion of land the necessary supplies for a million and a half of people. The milk is of a quality so artificial, that we know not whether, in strict propriety of language, the name milk can be at all applied to it: the animals that yield it are fed not upon wholesome and natural pasturage, but in a great degree on grain and other articles. It will not be supposed that the milk which they yield is identical in wholesome and nutritious qualities with the article which would be supplied, if a tract of land of sufficient extent for the pasturage of cattle was made subservient to the wants of the metropolis. Add to this, that inferior as must be, under such circumstances, the quality of the milk, there exists the strongest temptations to the seller who retails it, to adulterate it still further, before it finds its way to the table of the consumer.

Mr. Warner, already mentioned, stated that, great as the advantage of a rail road would be to graziers who supplied the London butchers, it would be of still greater advantage to dairy farmers.

'Have you ever had offers made to you to supply any part of London with milk?—I have; but have never been able to comply with them on account of the want of a conveyance.

'If there was a rail road, by which you could transmit milk, and thus avail yourself of such an offer, would it add materially to the profits of your farm?—There is no question that it would increase the profit at least 400 or 500 per cent. *I have no doubt of it, on milk and butter.*'*

In the produce of the dairy and the garden, it is not merely by smoothness and ease of transport that a rail road would offer facilities. Articles of a perishable nature must be supplied to the consumer within a short period after they are taken from the soil. The speed of rail road conveyance being six or seven times that by cart or wagon, the consequence would be, that such articles would be supplied to the metropolis from a circuit with a radius six or seven times the length of that which now supplies them; and consequently the land which would become available for the metropolitan markets, would be from thirty-six to forty-nine times the present extent; supposing rail roads to diverge in all directions from the metropolis, and to be furnished with their usual ramifications.

In our former article on this subject, we attempted to show, by general reasoning, the immense benefits which would accrue, both to farmers and landlords, as well as to the inhabitants of towns, by carrying extensive lines of rail road through populous districts, connecting them with those places from which supplies of food and other necessaries might be obtained. We showed that the factitious value which tracts of land immediately surrounding the metropolis and large towns acquire from the proximity of the markets, would be moderated, and a portion of their advantages transferred to the more remote districts; thus equalizing the value of agricultural property, and rendering it in a great measure independent of local circumstances. We showed, further, that the profit of the farmer, and the rent of the landlord, would be benefited by the reduced cost of transport, and that such benefit would be likewise shared by the consumer; in fact, that the advantages of centralization would be realized without incurring the inconvenience of crowding together masses of people within small spaces; and that the whole face of the country would be brought to the condition, and made to share the opportunities of improvement which are afforded by a metropolis, and by towns of the larger class. At that time, however, we had no specific evidence to adduce in support of our reasonings, so as to reach those minds which can only be influenced by a direct appeal to facts. The subsequent extension of railways has brought to light a body of evidence, so extensive, that our only difficulty lies in the selection of such parts of it as may not exceed our necessary limits.

The beneficial effects of the Liverpool and Manchester railway on the value of land in the district through which it passes, have forced conviction upon the minds of those who were the most conspicuous opponents to that project.

Mr. J. Moss, a director of the Manchester railway, gave the following testimony:—

'Is it contemplated to have a rail road between Birmingham and Liverpool?—It is quite arranged.

'Have you made application to the owners of land for their consent?—As far as our half goes.

'Have you found owners, on the line between Liverpool and Birmingham, to consent to the rail road there, who, nevertheless, opposed the Liverpool and

* This enormous estimate of the advantage is no doubt founded on the supposition that dairy produce would maintain its present price;—an obvious error, but still the advantage would be very considerable.

Manchester line?—Several; among others, Lords Derby and Sefton.

'Did Mr. Heywood of Manchester oppose the Manchester Rail Road?—Yes.

'Did he afterwards complain of its not passing through his lands?—He complained very much of it.'

If the ill effects of its opposition, on the part of landed proprietors, to projected rail roads were limited to the injury which they inflict upon themselves, the public would have less reason to complain of it; but unfortunately other extensive injuries have been thus produced. The opposition by Lords Derby and Sefton to the Manchester railway bill, compelled the company to deviate from the line of road which they first proposed, and which Mr. Stephenson, their engineer, pronounced to be the best. That line must have passed through a part of the property of these noblemen, whose opposition would at that time have defeated the bill. The company were therefore compelled to select another line, which was not only much more expensive in the formation, but which has been since productive of consequences most injurious to the road, and to the interests of the company and the public.

The line which the engineer was compelled to adopt, imposed upon him the formidable enterprise of crossing Chat Moss; and involved the company in an enormous expense in forming a solid road over that extensive morass. This, however, was not the only or the most extensively injurious effect: it became necessary to carry the line of road over an elevation, so that the moving power had to overcome a slope rising at the rate of one in ninety-six in both directions, and extending through more than a mile and a half in each case. We explained in our former article, the injury which such an ascent produces: to draw a load up a slope of this degree of acclivity requires an impelling power, amounting to nearly four times the power necessary to draw the same load upon a level; the consequence is, that either auxiliary engines must be kept constantly at the foot of the slope, or else the impelling engine must be constructed with four times the power necessary on the level, and with a proportionate increase of strength and weight. We may safely assert, that no circumstance connected with the Manchester railway has been a more fertile source of expense and inconvenience than this occurrence. But if any thing be wanting to demonstrate the mischief of the proceeding out of which this has arisen, it is the fact detailed in the evidence of Mr. Moss, that a second line of railway has been in contemplation, connecting Liverpool with Manchester; that this second line is countenanced and encouraged by these very noblemen, Lords Derby and Sefton; that it is to pass through their grounds, and, we presume, to take the very course which was originally contemplated by the present railway company, and from which they were driven by opposition.

'Has there not been a scheme for another rail road?—Yes.

'Is it to pass through Lords Derby and Sefton's land?—Yes; they both consented. They threw us back the first year by the opposition to our road, and we then lost such a line as we never could obtain again. Since this, they have both consented that the other line shall pass through their property.'

Other proprietors, however, more speedily learned their error, and actually made interest to get the line through their property.

'Do you know Bold Hall?—Very well, it is a fine house.

'Is it near Liverpool and Manchester?—Yes; the proprietor complained very much, that we made a complete bend, to avoid his property.

'Did he afterwards wish you to cut off the bend, and go nearer by a straight line? Yes; and we agreed to go much nearer to his house.'

Besides the permanent advantages to land by opening large markets for every species of vegetable, animal, and mineral production, railways are attended with a variety of subordinate benefits, which, though they may appear inconsiderable, when compared with those already mentioned, yet ought not to be wholly disregarded. Among these may be mentioned the extensive employment of the local population, in a work in which by far the greater proportion of the labor is of a rude kind; likewise the purchase of materials of various kinds from the adjacent land owners. It was proved that on the Stockton and Darlington railway, as well as on other similar works, large sums were paid to the land owners for gravel, timber, and stone, for materials for bricks, and for various other purposes, independently of the land purchased from them. It was also proved that a very large proportion of the poor rates of the parishes through which railways pass are paid by the railway company. The Manchester railway company, for example, contribute not less than £4000 per annum to the poor rates of their parishes.

Mr. Pease stated that more than half the entire rates of several of the parishes through which the Stockton and Darlington railway passes, are paid by the railway company. But in addition to this, the actual amount of rates is lessened by the extensive employment afforded for labor on the railway. Mr. Lee stated, that of the poor rates in the parish of Newton, one-fourth part was paid by the Manchester railway company.

The speed of transit, and the consequent frequency of communication between places of great commercial intercourse, are matters, the importance of which can scarcely be overrated in this country. The time between Liverpool and Manchester, being a distance of about thirty-one miles, is now about an hour and a half; there are three deliveries of letters by post daily between these two places; so that two letters may be written and one answer received by the same correspondents in the course of a day. The frequency of communication might be still greater: nine trains of coaches start daily from each place, and if it were necessary, there might be nine deliveries in each town. When the lines of railway from London to Birmingham, and from Birmingham to Manchester, shall have been completed, the *time* from London to Liverpool will be about eleven hours; the mail which leaves London at eight o'clock in the evening, will therefore be delivered in Liverpool before nine the following morning. The time between London and Birmingham will be five hours and a half; there will probably, therefore, be two mails daily. The letters despatched from London at eight o'clock in the evening would be delivered in Dublin the following evening. From some improvements which are

in progress in the steam-packets, it appears that, under average circumstances, they may be depended on to make the voyage from Liverpool to Kingston (near Dublin) in ten hours: the mail which would arrive at Liverpool at seven in the morning would therefore be at Dublin at six in the evening, so that the Dublin merchants could answer their London letters the same night. It would, therefore, be possible that an answer to a letter from London to Dublin could arrive in London in about fifty hours after the despatch of the letter.

In the evidence of Mr. Moss we find a striking instance of the preference given by the public to rail road conveyance.

'Do you know whether there are some places on the line from Liverpool to Manchester where persons go down a considerable distance to come to the rail? Yes; Southport is an example. This town is 38 miles from Manchester, and 25 from Liverpool. Persons going to Manchester prefer to come the 25 miles to Liverpool, and 30 along the rail road, making 55 miles, to going 38 miles by the direct road to Manchester.

'Do they do that with a saving of time and expense? They save both time and expense.

'Being aware of these facts, and knowing the projected line between London and Liverpool, are there many places from which persons would come to the rail road, for the purpose of going to London, rather than take the direct turnpike road? Yes; all places in the manufacturing part of Yorkshire, such as Bradford, Halifax, and Leeds; they would come to Manchester, and there take the rail road.

'What would be the saving from Leeds? It would be 40 miles round; but it would save four hours in time, and £1 in money.

'What would be the saving from Rochdale? Ten hours in time, and 30s. in money.'

A large portion of the time of those farmers and graziers, living at a distance from London, who are obliged to attend the London markets, is consumed in making the journey. Mr. Robert Attenborough, a farmer and grazier residing at Braybrook, eighty miles from London, stated that his business obliged him to attend once a week at Smithfield market; that it takes him three days and a night, travelling at night, to go up to London, do his business, and return; that he seldom gets home till four o'clock on Sunday morning; and that a like inconvenience is sustained by the other farmers and graziers in his neighborhood: that besides the expenses on the way, the fare of the coach is £3 4s., and that the sacrifice of his business at home is the consequence of his journeys to London. A rail road would take him to London in about four hours, and starting in the morning he could arrive at home at a reasonable hour the same night.

By the evidence of other witnesses it appeared that a saving to a very large amount has been made by houses of business in Manchester, since the establishment of the railway, in their agencies alone. Some notion of the extent of this may be formed, when we state that several houses have saved £500 a year in this item of expenditure.

The advantage of the increased speed and cheapness of communication obtained by railways, worked by steam-engines, is not confined to the saving of the time and money of those who are compelled by business, or induced by pleasure, to travel. Vast numbers, who, under other circumstances, would remain stationary, find it for their advantage to avail themselves of the opportunities of intercourse with distant places thus opened to them. It appears by the evidence of Mr. Booth, that before the establishment of the railway between Manchester and Liverpool, there were about twenty-two regular coaches running between these places; these coaches were licensed to carry about 700 persons; and taking them at their average number, they may be estimated as having transported 450 persons daily between these two towns. The inside fare was ten shillings, the outside six; and the time of the journey varied from four hours to four hours and a half. The fare at present, on the rail road, by the first class train, is five shillings and sixpence, and by the second class, three shillings and sixpence; being about half the fare by the coaches; and the time of the first class an hour and a half, and of the second class two hours; being less than half the time occupied on the turnpike road. The number of passengers between the two places in the six months ending in December, 1833, was 215,071 booked; to which if we add 5,000 for the passengers taken up on the road and not booked, we shall have a total of about 220,000: if we divide this by the number of days in the half-year, we shall find that the average daily including Sundays, was 1,209. It appears, therefore, that the number of passengers between these towns has been tripled since the establishment of the rail road;—in other words, about 800 persons daily, who have occasion to pass between the two places, but who were before prevented from doing so, either by reason of the time or expense of the turnpike road, are now enabled to perform the journey.

* * * * * *

The ill effects of the slopes on the Manchester and Liverpool railway have impressed on engineers the indispensable necessity of avoiding them, or rendering them as gentle as possible in future undertakings. This object will be attained in a great degree on the Birmingham and London line, but at an enormous expense. The country through which it will pass is of an undulating character, so that there is scarcely a mile of the road in which either cuttings or embankments will not be necessary. Where the elevations to be encountered are inconsiderable, a level is obtained by forming a chasm in the crest of the hill, and using the stuff removed from it to form an embankment in the valley; but there are numerous elevations along the proposed line of road, which either from their great height or other causes, render this method impracticable. In such cases the level of the road will be maintained by penetrating the elevations by tunnels. Of these structures eleven were proposed in the parliamentary plan; but it is probable that cuttings will be substituted for some of them as the work proceeds, and that the actual number will not exceed eight: the largest will be constructed at Kilsby, near Daventry, seventy-seven miles from London; it will be about a mile and a half in length. Another, situate about two miles beyond Watford, will be a mile in length. That which will pass under Primrose Hill, and under the roads leading from the Regent's Park, and from St. John's Wood to Finchley, will be half a mile in length: one near Weedon will be three quarters of a mile long, but

none of the others will exceed a quarter of a mile in length.

The principal obstacle to the adoption of tunnels on railways, worked by steam power, has been the want of sufficient ventilation. The furnace of the engine soon renders the air unfit for breathing, and the impurity produced by the passage of one engine might continue until the arrival of the next. It is proposed, in the longer tunnels, to overcome this difficulty by providing shafts or chimneys at short intervals, carried from the roof of the tunnel to the surface of the ground above. In the case of the long tunnel at Kilsby, some of these shafts will be one hundred feet high; in the other tunnels they will vary from thirty to seventy feet; all of them will be eight feet in diameter. We are not aware whether the sufficiency of such an expedient for the purposes of ventilation has yet been ascertained by experiment. It has been stated that the speed with which the engines will traverse the tunnels will be so great, that very little ventilation will suffice. But the ventilation necessary for the tunnel will be the same, at whatever speed the engine may proceed; for the air drawn through the fire during the passage of the engine will be the same whatever the speed may be. Each stroke of the piston will draw through the fire the same quantity of atmospheric air; and it is obvious that the same number of strokes of the piston will produce the same number of revolutions of the wheels, and therefore the same progressive advance of the engine at whatever rate the piston may move. If the engine moves rapidly through the tunnel, it will, therefore, still vitiate the same quantity of atmospheric air; but there will be this convenience, that the passengers will not be detained in the air so vitiated any considerable length of time. The longest tunnel upon the projected line will be traversed in less than five minutes, and the shafts will subsequently remove, though perhaps not very speedily, the impure air.

In cases where it is not found practicable to traverse the valleys by embankments, bridges to support the rail road, of great extent, have been projected, by which the valleys may be arched over. One of the most stupendous of these works is the viaduct intended to bestride the valley of the Ouse. This work, which will be situate between Newport Pagnel, and Stoney Stratford, will cross the valley of the Ouse about a mile and a half eastward of the latter town; its extreme length will be a mile and a quarter, and the height of the level of the rails at the centre arch above that of the water will be nearly fifty feet; the centre portion will be supported on seven magnificent arches, each of fifty feet water way; the key-stone of each arch not to be less than twenty-five feet above the surface of the ground. The extreme ends of the viaduct will be formed by embankments. By such gigantic efforts of labor and skill, the inequalities of the ground will be greatly diminished, though not absolutely overcome. * * *

THE FENCE TAX.

To the Editor of the Farmers' Register.

The enclosing fence of one mile square will cost, in this part of the state, if made of good materials, two thousand dollars—and good the materials must be, if they last 20 years. The interest upon this sum is $120, and the annual waste $100, making the sum of $220 per annum for a certain charge upon that much land, for no other real or pretended purpose, than to make the contents of the enclosure legally the owner's. And even then, sir, he has but colorable pretence to be the owner; for such has been the demoralizing effect of the enclosing law, that those who live upon the common, can and will find their way in—and that in such a way as to leave you without a remedy.

If, sir, you give men a right to enter your kitchen, how long will they be kept out of your pantry, if they are hungry and have winded the scent of roast and stew? The beasts of the field have not, like man, an *imaginary* moral restraint: they, without craft, go for all they can get—and, having the legal right to try every pannel, they must be lower in rank than "poor shoats" if they fail; and without intending more than to do sheer justice to this case, I will ask how long the owner would refuse to give them his aid? No virtue, sir, will resist cupidity, if you make it legal to pass the outer barrier. Appetite has no moral law.

I would ask our political economists if they could guess why land is so low, and so much neglected in Virginia? Poor Virginia! how long will thy children hang mill stones upon thy neck? How long will they keep thee ragged and naked? Yet thy very name is a blessing to thy children.

This rent charge of $220 upon every 640 acres of land is what every purchaser must add to the sum he pays for land before he can say what the real cost is; and it may be fairly said, that every landholder pays that sum for being legislated into common. Can we be forever blind—forever lawless? If my brother farmers would give this subject its due share of consideration, I am persuaded, it is far more important than the making of a president—for, make who they may, the crafty only will divide the spoils.

X. Y. Z.

Fairfax County, 13*th Jan.*, 1835.

From the Petersburg Intelligencer.

REPORT ON THE MODE AND ADVANTAGES OF IMPROVING THE NAVIGATION OF THE UPPER APPOMATTOX.

Agreeably to notice published in the Richmond Enquirer, the Constitutional Whig, and Petersburg Constellation, a meeting took place in the town of Farmville, on the 2d January, 1835, for the purpose of taking into consideration the navigation of the Appomattox river by the lock and dam system, from Petersburg to Farmville, and by the jettee and sluce dam system, from Farmville to Planterstown. On motion, Thomas A. Morton was called to the chair, and Henry Brazeal appointed secretary of the meeting. N. E. Venable was requested to read the report of the engineer employed by the Board of Public Works, which report was accordingly read. Whereupon the following plan for improving the navigation of said river was submitted for consideration, to wit:

It is proposed to improve the navigation of the Appomattox river, by locks and dams, from Farmville to the head of the canal near Petersburg, so as to give two feet depth of water at all seasons of the year; and by jettees and wing dams from Farmville to Planterstown, so as to

give one and a half feet depth of water the greater part of the year. With a view to this improvement the Board of Public Works has had a survey of the river made by a competent engineer, who has reported favorably of the above system of improvement, as best suited to the river; and states the cost of the whole work at $84,984 90. It has been thought by some who have examined the report of the engineer, that the estimates are larger in amount than necessary; but as estimates of such works are rarely too high, it will be safe to take the estimates made as the basis of the calculations to be made in applying to the legislature for an act incorporating a company to do the work. It remains to show how the capital is to be raised to complete the work.

It is proposed (with the consent of the Upper Appomattox Company) to obtain an act of incorporation for a company to improve the river by locks and dams from the head of the canal to Farmville, and by jettees and wing dams from Farmville to Planterstown, with a capital of $85,000.

2d. That this company, on the completion of the work to Farmville, be entitled to receive tolls on all articles passing the river, equal to, and the same with, the tolls received by the Upper Appomattox Company with the exception of wheat, flour, and plaster of paris, and to receive on wheat and flour half the present tolls, and on plaster of paris no toll: provided, that the profits of said company shall not exceed 8 per cent. per annum after paying the annual necessary expenses, and provided that the rights of the Upper Appomattox Company be no way affected by the charter of the new company.

To make it evident that the above propositions are reasonable, and the improvement practicable, it is only necessary to review the present state of the trade on the river, and the probable increase, in case the improvement shall be made. The tolls on the present trade, which average about $5000 per annum, will pay a dividend of about 6 per cent. on the proposed capital, leaving the income on the water privileges which will accrue to the company, to pay the annual expenses. It is believed however that a constant navigation of two feet depth will increase the tonnage of the river fourfold: this if it should be realized, will have the effect to pay the stockholders 8 per cent per annum and reduce the tolls to a very low rate; add to this the fact, that the improvement will lessen freights, to an amount equal to three times the toll levied on the produce. Independent of the great advantages of reduced freights, the certainty of this channel of trade will cause it to be used almost entirely by the people of the country south-west of Petersburg, both for imports and exports. When this is the case it may well be imagined that the amount of tonnage will be great as the most of the products, for export and imported articles of consumption, for the counties of Amelia, Powhatan, Cumberland, Nottoway, Prince Edward, Charlotte, and a portion of the same articles, from Chesterfield, Buckingham, Lunenburg and Mecklenburg, will pass through this channel.

The present freights from Farmville are as follows:

Tobacco $3 50, toll 42 cents—total, $3 92 per hhd.

Wheat 12 cents per bushel, toll 2 cents, total 14 cents.

Other articles in proportion.

Back loads are brought for 25 cents per hundred pounds.

Under the new system.

Tobacco would be, freight $2, toll 84 cents per hhd.—total $2 84.

Wheat, freight 6 cents, toll 3 cents, total 9 cents.

Other articles in proportion.

Back loads would be brought for half the present rates.

Thus it will be seen, that the saving in expense alone would be more than double the present toll, and the certainty of the way to market would be a still greater advantage to the agricultural interests and trade of the country.

After the report of the engineer and the above specified plan were duly considered, on motion it was resolved, That James Madison, N. E. Venable, William Willson, John Miller, H. Brazeal, J. R. Palmore, Thos. A. Morton, or any three of them, be and they are hereby appointed a committee, who are authorized and required to draw up a memorial, and cause the same to be presented to the legislature, embracing the plan and estimates of tolls and dividends which are embodied in the statement which has been submitted as above.

Resolved, That the commitee aforesaid be required to embrace in the memorial, the following, to wit—That in the event of the legislature chartering a company for effecting the navigation upon the plan aforesaid, that the company be authorized from time to time to cause an inspection of the locks of the mills now on the river, and should they find any of the said locks at any time in an unsafe and doubtful condition, they shall give notice to the owners or occupiers of the mill, and unless said owners or occupiers shall in—— months cause the said locks to be put in good condition for the speedy and convenient passage of boats, then the said company shall be authorized to cause it to be done, and to collect or receive the cost thereof from the owner or owners of such mills.

Resolved, That the proceedings of this meeting be published in the Richmond Enquirer, the Constitutional Whig, the Petersburg Intelligencer and Constellation.

Resolved, That so much of Mr. Conty's report as concerns the contemplated improvement be published with the above proceedings.

On motion, the meeting adjourned.

THOMAS A. MORTON, *Chairman.*

—

Report of the Engineer.

Richmond, Dec. 22, 1834.

Gentlemen—Having been appointed by your honorable board, to execute an act of last session of the legislature, the object of which was the "survey of the Appomattox river, from the town of Petersburg, to the highest practicable point of navigation, and make an estimate of the costs of improving the navigation thereof, by locks and dams, jettees, or wing-dams, or a combination of the three modes of improvement, so as to give at least two feet depth of water from the town of

Petersburg to the town of Farmville, at all seasons of the year," the following report is summitted:

About the middle of July last, I proceeded to the town of Farmville, and commenced the survey, extending it up the Appomattox to the South Fork, a distance of 38½ miles, with a fall of 243.69 feet. The present charter of the Upper Appomattox Company extends to Planterstown, a distance of 22½ miles, with a fall of 96.15 feet, averaging 4.9 feet per mile; the remaining 16 miles has a fall of 175.54 feet, averaging upwards of 9 feet to the mile. The great fall in this portion of the river, and the very considerable expense attending its improvement, induces me to think that Planterstown is as high a point as the company's attention should be directed for the present. Therefore, the estimate of expense extends no further.

The principal obstructions between Farmville and Planterstown, are the number of shoals, many of which are gravel, difficult to improve, and uncertain of remaining so; in reaches of the river free from shoals, the navigation is materially injured by the number of trees and logs, occasioning an accumulation of sand and diffusing the water over its bed, so that no sufficient depth can be obtained until the removal of such obstructions. Jettees may be beneficially applied in such places after the removal of logs, &c. Wings with side dams should be used in the improvement of shoals. By throwing the quantity of water into a body, and retaining it between the side dams it secures a more regular depth and prevents any accumulation of gravel, &c. By the application of jettees or wing dams to a shoal of considerable length, a sufficient depth may be obtained between the jettees from the construction of the current; but when allowed to spread, it loses its scumming property: a deposite takes place between the former and lower jettee, which proves injurious to the navigation. By proper application of jettees, wing and side dams, the removal of logs, gravel, &c. a navigation of 18 inches in depth may be obtained to Planterstown, the greater part of the year.

The fall of the river from Farmville to the head of the canal in Petersburg is 180.26 feet, and distance 90 miles 497 yards. The act of the legislature calls for not less than two feet depth of water at all seasons of the year. During the survey the quantity of water was measured in several places, and found inadequate to furnish the depth called for by the act. The improvement of a river by jettees, wings and side dams, is a very uncertain and imperfect mode; much money may be expended, and the winter floods may cause a renewal of the same expense if this method is persisted in. The improvement of the river Clyde, in Scotland, was commenced first by jettees, which were abandoned, then by contracting the current by parallel walls of stone thrown in promiscuously, besides the great expense in the use of the dredging machine. Yet, late accounts attest the imperfection of this system of improving rivers, and the navigation has been much impeded by the frequent formation of obstructions.

Being satisfied that the best mode of improving the Appomattox from Farmville down, and furnishing the called for depth, can only be obtained by a system of dams and locks; particular regard has been had in placing them in such situations, both for security to the works and to occasion as little damage as possible by their overflowing the adjoining low grounds. The elevation of the proposed dams, are from 1 foot in height to 6 feet. From this arrangement no apprehension need be entertained of much injury by overflowing, and those low grounds at the dams, may be successfully drained by passing round and discharging the water below. The situation of the dams are most generally at the head of the shoals with a view of obtaining a good foundation and the least possible height. The entrance of the canals (for the safety of the boats) are a short distance above the dams, and communicating with the river at the lower end of the shoal, when the locks are made more secure by being protected from the current of the river, and constructed at less expense than if connected with the dam.

Particular attention should be had to the cutting down and removal of the trees on the banks of the river; they are numerous, with their branches frequently interwoven across the stream. The locks at Venable and Stony Point Mills require renewal; much delay and loss is sustained by the imperfection of these locks during a drought.

The sill of the lock at Exeter Mills cannot be more than four inches below the surface of the water during a low stage of the river, therefore, it becomes useless. During a high freshet in the river, the head gate cannot be opened, causing a detention of several days to the boatsmen. The locks at Clemingtown appear to be in good condition, and are constructed on the best principle of any between Farmville and the head of the canal.

Estimate of the probable expense of improving the navigation of the Appomattox river from the town of Farmville to Planterstown by jettees, side and wing dams, $10,276 20.

Estimate for completing a two feet depth navigation of the river Appomattox between the town of Farmville and the head of the canal at Petersburg $74,708 70. By building the locks of stone laid in water-proof cement, and including the lockage at the several mills, it would increase the amount to $152,000.

JOHN CONTY.

To the Board of Public Works.

From the Horticultural Register.

VINEYARD OF CLOS DE VOUGEAUD.

In the middle and northern departments of France, and in the vineyard culture, the vines are kept low, like plantations of the raspberry, the vines being planted in close order; or they are trained to low stakes, which are renewed every year. When the vine has risen to a height sufficiently above, it is bent over, and passed to the top of the next stake, and secured in its rear; its luxuriance being thus restrained.

The same system of restriction is practised at the *Clos de Vougeaud.* This is regarded as the best vineyard in France, and was sold during the revolution, and in 1794, for one million one hundred thousand francs. This vineyard is walled round. The vines being kept low, and the ground never manured. The soil is calcareous, on a foundation of limestone or calcareous rocks.

DIARY OF THE TEMPERATURE AND STATE OF THE WEATHER, FROM OCTOBER 1, TO DECEMBER 31, 1834,—OBSERVED AT FORT MONROE.

OCT.	THERMOMETER. VII. A. M.	II. P. M.	IX. P. M.	WINDS.	WEATHER
1	70	75	73	S.	fair.
2	72	77	75	S. E.	rain.
3	80	73	73	"	cloudy.
4	72	78	74	S. W.	fair.
5	70	68	66	N.	"
6	66	67	66	"	"
7	68	70	69	S. E.	"
8	69	72	70	S.	cloudy.
9	70	75	69	S. W.	"
10	63	63	61	N.	fair.
11	61	62	62	"	"
12	63	72	68	E.	"
13	67	69	62	N.	cloudy.
14	55	67	57	"	fair.
15	59	64	62	"	"
16	61	68	65	N. E.	"
17	64	69	67	S.	"
18	66	72	70	"	"
19	69	59	56	N.	rain.
20	55	55	53	"	fair.
21	52	57	55	S.	"
22	54	60	62	"	"
23	59	65	63	"	"
24	62	64	63	S. W.	"
25	62	66	60	S. E.	cloudy.
26	59	63	59	N. W.	fair.
27	63	70	67	S.	"
28	60	68	65	S. E.	cloudy.
29	63	67	64	W.	fair.
30	63	65	61	N. E.	"
31	59	62	58	S. W.	"
	1976	2082	1995	Total No. of degrees.	

NOV.	THERMOMETER. VII. A. M.	II. P. M.	IX. P. M.	WINDS.	WEATHER
1	60	64	62	N. E.	cloudy.
2	59	62	60	N.	"
3	59	61	59	N. E.	fair.
4	53	60	58	S. W.	"
5	57	61	59	S.	cloudy.
6	57	56	53	N.	fair.
7	51	59	57	N. E.	"
8	56	61	57	E.	"
9	55	60	58	W.	"
10	57	63	59	S. W.	"
11	58	60	58	W.	"
12	57	62	60	S.	"
13	57	63	61	S. E.	"
14	59	64	61	S. W.	"
15	58	60	56	N. E.	rain.
16	52	56	50	"	"
17	49	50	49	"	"
18	48	51	48	N. W.	fair.
19	46	50	48	N.	"
20	47	52	54	"	"
21	46	54	52	"	"
22	50	56	52	S.	"
23	47	49	44	N.	"
24	40	42	36	"	"
25	34	37	35	N. E.	"
26	32	40	45	N. W.	"
27	42	50	47	E.	"
28	45	52	51	S. E.	"
29	50	56	54	S.	cloudy.
30	48	59	49	W.	fair.
	1529	1670	1592	Total No. of degrees.	

DEC.	THERMOMETER. VII. A. M.	II. P. M.	IX. P. M.	WINDS.	WEATHER
1	45	58	57	S.	fair.
2	59	62	54	N. E.	rain.
3	52	50	46	N.	cloudy.
4	32	49	47	S. E.	"
5	38	50	49	S.	rain.
6	48	60	58	S. W.	fair.
7	47	58	58	"	"
8	54	62	55	N.	"
9	34	53	35	"	"
10	32	46	42	S. W.	"
11	38	56	44	"	"
12	38	47	42	"	"
13	39	52	52	"	"
14	46	49	35	N. W.	cloudy.
15	26	44	42	N.	fair.
16	40	50	46	N. E.	"
17	43	40	41	"	cloudy.
18	42	43	43	N.	rain.
19	44	50	48	"	cloudy.
20	48	55	51	"	"
21	40	52	50	N. E.	"
22	50	57	55	N.	"
23	48	54	53	N. E.	"
24	45	50	48	"	"
25	49	43	41	"	"
26	36	35	34	N.	rain.
27	31	36	45	N. E.	fair.
28	36	40	39	"	rain.
29	42	43	41	"	"
30	40	44	42	N. W.	fair.
31	40	44	40	N. E.	"
	1302	1532	1433	Total No. of degrees.	

ABSTRACT FOR THE QUARTER.

MONTHS.	THERMOMETER.												WINDS.										WEATHER.										
	Highest degree.			Lowest degree.			Mean temperature			Hottest Day.			Coldest Day.			N.	N. W.	N. E.	E.	S. E.	S.	S. W.	W.	Prevailing.	Fair.		Cloudy.		Rain.		Snow.		Prevailing.
	VII.	II.	IX.	VII.	II.	IX.	VII.	II.	IX.															Days.		Days.		Days.		Days.		
OCTOBER.	80	78	75	52	55	53	68	67	64	3			20			9	1	2	1	5	8	4	1	fair.	23		6		2				fair.
NOVEMBER.	60	64	62	32	37	35	50	55	53	1			25			7	2	7	2	2	4	3	3	fair.	23		4		3				fair.
DECEMBER.	59	62	55	26	35	34	42	49	46	2			26			9	2	11		1	2	6		fair.	14		11		6				fair.

ON THE MANNER AND TIME FOR SOWING CLOVER SEED.

To the Editor of the Farmers' Register.

In consequence of my reading an ingenious article in the first volume of the Register, (page 566,) on sowing clover seed, I was induced last spring to try one of the experiments therein recommended. Three beds extending quite through a large field were *harrowed* previously to their being sown. Two of them were rolled after the seed had been applied—the third not. Between these beds I observed no difference. I cannot therefore say whether or no the rolling would generally be of any use. Perhaps it may have been owing to the subsequent state of the weather that no difference was perceptible. Theoretically, I should certainly prefer rolling, for the sake both of the wheat and the clover. Between the three beds, however, and the land on each side, there was a striking and gratifying difference during the whole year. They could be traced after harvest, with the eye, at the distance of several hundred yards, by their superior verdure and luxuriance, throughout their whole extent. A nearer inspection showed that they were much more thickly set than the neighboring beds, on which the same quantity of seed had been put. The success of the experiment is as complete as can be inferred from a single trial: to me it is conclusive. I think an important consequence may be deduced from this plan that did not occur to its author—I mean the estimated saving of one-fourth of the usual quantity of seed, with greater certainty of success, and regularity of distribution, than in the common way with the more liberal allowance. It needs but little reflection to form some idea of the immense advantage that would thus result to an extensive region, for which nearly the whole supply of this article has to be purchased from a distance. The ordinary mode of sowing clover seed on a hard surface, and then leaving it uncovered to take its chance, is liable to many objections. Much seed is lost: it is irregularly distributed—the plants frequently growing in bunches, and not unfrequently failing altogether. But little land is so neatly prepared as not to have numerous inequalities. The seed is liable to roll, or be washed into the small cavities or depressions, while the eminences are either not at all, or only scantily supplied; and the few seeds that may remain and vegetate in those situations, are exposed to injury from drought or frost, or both. By previously harrowing, the seed sticks where it is deposited; and even if not rolled, it soon gets covered by the settling of the loose earth, from rain and other causes.

I have taken some pains to learn the opinions and practice of intelligent farmers in regard to the management of clover seed. The result of these inquiries, briefly stated, may not be amiss. One gentleman, as remarkable for agricultural, as was a certain scourge of the Philistines of old for physical strength, prefers sowing in January: another, whose conclusions are not often wrong, the early part of February, which he considers so far preferable even to the latter part of the same month as to justify one's paying, if necessary, double price for the seed: he mixes the requisite quantity of seed for each acre, with one bushel of damp saw dust; and plasters in the month of April, when the plants are well up. A third gentleman,

who is very observant, and keeps an accurate diary, sows the clean seed from boxes, with small holes in different places to regulate the quantity, during a *cold* spell in February, or if it does not come in February, in March, (for he says it always will happen in one month or the other) and never applies the plaster till the second spring, in order to avoid the rust in his wheat, to which malady he thinks it is rendered more liable by the use of that mysterious mineral. The method of a fourth gentleman is to mix three bushels of plaster with one of seed, and to sow at first half the quantity intended to be applied, going over the whole ground, then returning to the place of commencement and sowing the residue, so that the ground is twice sown over to insure greater regularity, and at two different periods, to afford a better opportunity of escaping destruction by frost; the full quantity of gypsum is afterwards applied when the clover plants get in the third leaf. The opinion of the writer of this article is in favor of sowing from the 25th of January till the 20th of February, taking all circumstances and seasons into consideration. By harrowing the land, and still better, I presume, by rolling also, clover may doubtless be sown with perfect safety, considerably earlier and later than the period above specified. It may be useful here to state that some sensible and successful farmers consider a bushel of plaster and ashes mixed in equal quantities, as beneficial as a like measure of the former article alone, and of course, much cheaper, especially in the interior, where to the first cost of the commodity is to be added the cost of carriage.

A PLANTER OF THE LOWER JAMES.

January, 1835.

For the Farmers' Register.

ON THE PROPRIETY OF CORRESPONDENTS SIGNING THEIR PROPER NAMES.

——"What is't you seek?
——————Your names!"

It is in my humble opinion extremely important that every correspondent should subscribe his proper name to every communication made to this journal—more particularly when they contain any specific facts, or experiments. The papers, which are published in this, or any other scientific journal, without "a local habitation and a name," are of little or no value. It is important, and very desirable, to have attached to every communication the actual name of the author, and the county and state in which he resides, or his observations or experiments may have been made. The reasons are obvious to all. In the first place, it is necessary to have a responsible name for every fact or opinion, which may be stated. It matters not whether the individual be known to fame or not —his name being sent forth with his opinions, renders him cautious in promulgating doctrines, which he might blush to own. Secondly, in agricultural observations and experiments, it is necessary, that the particular section of country in which they have been made, should be accurately stated—inasmuch as climate and locality have an all-powerful influence over the products of the soil. It may be alleged, as an additional reason why the name should be published—that the carrying into practice of any new principles in farming is attended always with expense, and hence, it is important to know upon what authority you are justified in incurring any additional expense. It may often be attended with useful consequences, if the author were known, to correspond with him, and elicit additional information on the particular subject on which he has written.

For these, and other reasons which might be given, I would respectfully suggest to the editor of the Farmers' Register, the propriety of adopting the rule—not to publish any piece containing specific facts, without the author will attach there to his proper name. No communication I venture to affirm, would receive the least countenance from an editor of any scientific journal without a responsible name. Look in any medical journal, as the Philadelphia Journal of the Medical Sciences, or in any periodical containing essays on chemistry, mineralogy, or any other scientific subject, and it will be found that they are not sent forth *sub nominis umbra*, by A B, or C D, or E F, but have attached to each communication the actual author's name. Why not, then, in the name of common sense will not every gentleman who can contribute his mite of agricultural information, send forth with it, his own name? Is it modesty which forbids? Surely there is nothing immodest in discoursing through this paper with plain farmers. Is it the insignificance of the subject? Certainly, no enlightened individual will treat any subject connected with the most important of all occupations, lightly or indifferently. Agriculture, may now be considered as having taken a rank among the sciences—and every subject connected with it should be treated with that gravity, dignity and respect, which properly belongs to it. On this subject (of the importance which should be attached to the name,) it would be well to imitate the English or French farmers. It will be seen in reading a British or French agricultural paper, that almost always the name is appended, or no value would be attached to the publication. Even in our New England agricultural papers the name of the author is generally given. Hoping that these suggestions will have some influence with future contributors to the Register, and wishing the editor all success in his undertaking, I subscribe my name.

PETER DE QUIR.

Matthews County, Va.

P. S.—Is it ever advantageous or proper to burn land? Is there any kind of vegetation which grows on our fields, that it would be more profitable to burn off than to plough under? Will the ashes produced thereby compensate for the loss of vegetable matter? Will not the crop be better the first year when coarse grass or broom sedge is burnt, than it would be if ploughed in? But will not the land be ultimately benefited in a greater degree by turning in such a cover? These I conceive, to be interesting and important interrogatories, and I hope the Editor, and those correspondents whose experience will enable them to enlighten their brother farmers, will not hesitate to do so *in propria nomine*.

PETER DE QUIR.

For the Farmers' Register.

COMMERCIAL REPORT.

The regular business of Virginia has been interrupted during the greater part of this month, first by a long continuance of rain which rendered the roads impassable, and subsequently, by a degree of cold hitherto almost unknown in our climate, which closed our rivers, and the navigation of them was suspended an unusual length of time.

These remarks do not apply to Norfolk, whose favorably situated harbor is always accessible, and owing to this cause, an unusual number of vessels have sought that port during the severity of the winter. This advantage combined with others which that port possesses, will always insure to it an important trade.

Whilst supplies of cotton were retarded by the causes above mentioned, nearly all the stocks of that article in Petersburg were sold at 15 to 16 cents—but the late accounts from England being less favorable than had been anticipated, the price has declined one cent per pound, and from present appearances will go yet lower.

Fortunately for the planters, a large portion of their crops was sold under the most favorable circumstances. The dealers in this article are divided into two parties. One of them estimates the crop to be *smaller*, and the other *larger*, than the preceding one; and among the former are the planters and speculators at the South, who now hold a large quantity—the facilities afforded by the banks enabling them to retain it on hand. The planters have been unusually industrious this season, for although the crop matured a month later than the last one, and is said by them to be less productive, they have brought to the various markets in the United States, upwards of 100,000 bales more than they had at the same period last year.

The manufacture of cotton is carried on to a greater extent than at any former period; but the spinners in England possess such an unlimited control of the market in consequence of their great command of capital, that they can check any considerable advance in the price whenever they think proper to exert their power; and thus whenever speculators in Europe extend their operations at a high price, the spinners leave the article on their hands, and a decline ensues. This has proved to be the case during the last two years, as well as in former instances, and it is thus that variations occasionally take place in foreign markets which deceive and mislead us in this country. Some months must elapse before the probable extent of the last crop can be closely estimated—but meanwhile the best informed persons generally estimate the aggregate crop of the United States at about the same as the previous one.

The price of tobacco is higher than in January last, although the crop is larger. This may partly be ascribed to the increased operations of the manufacturers in Richmond, Petersburg, &c. who worked last year on a very reduced scale. The unusually small stock of Virginia and Kentucky tobacco in this country, also tends to advance the price. This however is not the case in Maryland: the quantity on hand there being large, and it is estimated that the export from thence this year will be very great. The current rates of tobacco in Richmond and Petersburg are $4 50 to $7 50, for very inferior up to fair qualities. The increased cultivation of tobacco in Holland and Germany, lessens the demand for ours in those countries, and the monopoly in France destroys competition in that market.

For flour and grain there is a very limited demand, none being required for export to Europe. Country flour is worth $4 62½ to $4 75—city mills $5 75. The canals of New York being closed, tends to increase the demand for Virginia flour. The stock of wheat is held almost exclusively by the Richmond millers.

The great increase of banking capital in many of the states renders money plenty, particularly where new banks have been created. Some efforts are now making to add to the number of banks in Virginia. If successful, if placed under proper restrictions, and prudently conducted, they may render every branch of business more active; but it may be questioned whether the great increase of such institutions, though apparently producing a momentary advantage, does not ultimately prove injurious, by creating an undue spirit of speculation, and giving a fictitious value to every thing in the shape of property. The policy however being generally adopted by other states, may render it in some measure necessary to counteract it by increasing these establishments in Virginia, and thus prevent an influx of paper from other banks, and the resort of our merchants to those institutions.

It is gratifying to remark the new works of internal improvement which are either commenced, or about to be undertaken. Of the former, is the rail road from Richmond to Fredericksburg and the Potomac, on which active operations are commenced on an extensive scale. The state having agreed to contribute her usual quota to this work, it will be completed with great expedition, and thus an almost entire line of communication by rail road will be formed from North Carolina through Virginia, and thence to Boston. With the aid of some enterprise on the part of North Carolina, the line would be complete to Georgia. *That* spirit of enterprise we trust will soon be aroused.

The great work of communication from James River to the Ohio will soon be commenced with the liberal aid of the commonwealth and of the city of Richmond—a work of great magnitude, but opening an extensive region of country to the commerce of Virginia, which would otherwise be attracted to Baltimore, or other cities. May the works prosper.

X.

January 26, 1835.

From the [Ohio] Farmer's Reporter.

PRESERVING POTATOES.

A good way of preserving sweet potatoes is when they are dug pack them up in dry sand, being careful to keep them covered so as not to get wet. In this way they will remain all winter as fresh and as good as when first dug. A highly respectable farmer, the quality of whose potatoes I myself tested last spring and found them of the first cut, assured me that this was the method he had practised for a number of years, and found it perfectly successful.

A PROFITABLE CHANGE OF A MILL POND FOR A CANAL.

To the Editor of the Farmers' Register.

Amelia, Dec. 30th, 1834.

The farmers of Virginia may indeed congratulate themselves that there has been established in their state, in your valuable publication, a medium through which useful information and suggestions may be diffused for the public good, which might otherwise probably be known but to a few.

In accordance with your request for presenting such improvements as may have been made to the public, I will endeavor to lay before your readers what I conceive to be an improvement of a kind important to owners of mills, (and not unimportant to the farming interest,) which has been made by myself, by means of a canal, dispensing entirely with the pond. The mill is situated on a small stream, known by the name of Buck Skin Creek, near the dividing line of Amelia and Nottoway, not exceeding three miles in length from the mill to its very source. The pond covered about twenty-five acres of land, and had probably been erected nearly a century. In the summer of 1833, the dam was swept away, and such a breach made, as induced me, as a matter of convenience to myself, to try the experiment with a canal, until the dam could be repaired. The canal was dug, and in a short time, principally with my crop hands, and upon trial was found to far exceed my most sanguine expectations—so much so, that I have declined rebuilding the dam. The present plan is much less troublesome and expensive. I have been enabled to grind for all the custom the mill gets, producing a toll from ten to twelve barrels of corn per month. In addition, I shall be enabled to bring into cultivation about thirty acres of valuable land, and it is highly probable will promote the healthiness of the neighborhood.

There are now two other mills in operation in my county upon the canal plan, that succeed wonderfully well; and could their owners be induced to give their views and experience, they might confer a great benefit upon the community. I do not hesitate to say, that in my opinion, one-half the mills in this section of Virginia might be worked by canals, dispensing with their ponds, thereby adding many valuable acres to the farms, and promoting the general health of the country. The experiment could be made without cutting down the dam. A canal should be cut around the pond at high water mark, until it reaches the stream above the pond. I should never have been induced to have made the experiment had I not been in some degree compelled by a concurrence of providential events; which fact forcibly evinces how unwilling we are to forsake early impressions and habits—believing with most of my neighbors, that such an attempt was futile and visionary.

T. J. P.

For the Farmers' Register.

ON THE NECESSITY OF SYSTEM AND ATTENTION IN THE FARMER'S BUSINESS.

It is entirely useless and unnecessary to waste time, which is precious to all, in querulous narration of the *exceedingly deplorable state* of agriculture—the impoverished, cadaverous aspect commonly exhibited on the surface of the Old Dominion. It is equally useless and unprofitable, to write a funeral oration for soil, long since *defunct*, or departed, and soon to be deposited in the grave of the "great waters." We shall briefly, and we hope more profitably, suggest a few disjointed and unconnected remarks, glancing at the causes, and designating the means to remedy or alleviate evils generally existing, and, we are compelled to acknowledge, exhibited in bold relief.

One of the most prominent causes which depress agriculture in Virginia, is the opinon entertained by many, that slavery is incompatible with improvement in agriculture. There never was a greater mistake—a more fallacious position. There never was an error more fatal in its consequences. A belief in this position, renders it impossible to him who entertains it, ever to improve his system of agriculture. We cannot, we will not persevere in toiling for that which we believe we shall ultimately fail to obtain. Why should we believe the position? We have the entire control of our slaves, and can give their labor what direction we please. Many hold them by inheritance, and have nought to pay for their labor but the moral obligation to feed and clothe them well. No free laborer in America, would perform the amount of labor performed by our slaves for the same remuneration. None can be obtained, either from the North or the South, who will agree to work for their food and clothing alone. All require more than this—consequently, slave labor is cheapest; and the cheapest labor presents the greatest facilities for improvement.

The misapplication of labor, is also a great cause of the depression of agriculture. Because, among other reasons, labor is cheap, no pains have been taken, no thought bestowed, to have it properly applied. This important item of good husbandry, has commonly, and is even now, left to agents uninterested in improvement, and frequently to the ignorance of the negroes themselves. Virginians are peculiarly averse, and bestow but little attention to what they consider the minutiæ of the farm: they think it sufficient to give general directions, without attending to the particular application of labor. Consequently, labor is often badly applied—time and attention devoted to one branch of business, which ought to be bestowed on another. In close connection with this evil, is another, and of equal magnitude—a want of practical knowledge, which renders us liable to be imposed on at every point. If we are destitute of practical knowledge, most of the work on the farm will be badly executed, and many evils will follow in the train. From bad work, we cannot reasonably expect good production; it must be proportionably deficient. This makes it necessary, in order to make even a tolerable crop, to expose a larger surface, which must be annually increased, in proportion to the progressive deterioration of the soil, until improvement becomes a dead letter, and soon the last remains of fertility are washed and extracted from the exhausted soil. Many proprietors are so entirely wanting in practical knowledge, that they do not know how to *set* a hilling hoe—and Cuffee may hold a high hand, and for ought they know, be doing good work, with his hoe so fixed that it cannot be made, by ordinary exertion, to cut an inch deep. It would be well if

this was the worst of it. Many, very many, never obtain much better knowledge of practical operations than they commence with: and that is commonly worse than none. This indispensable item in the prosecution of improvement, is also left to others, wholly uninterested in the improvement of the farm. To remedy these evils, rules should be established: it should be an established principle, that all manner and kind of work, should be executed in the best style: quality, and not quantity, should be the primary object of every farmer or planter. We should seldom, if ever, depart from this principle, for the sake of expediency. We should aim to acquire more executive (if I may use the expression) and practical knowledge. If this knowledge cannot be obtained in schools or colleges, it may in agricultural societies. Let us then form agricultural societies, enlist practical men, and apply the lever of associated action; without which, no important reformation has ever been effected—patriotism, philanthropy, and religion, forbid that this principle should be applied to so many objects, and agriculture be left to wend its own slow way unaided, unassisted. Let all lovers of improvement awake to the merits of this noble cause. Let us associate, combine, and bring to the aid of agriculture, that intelligence and enthusiasm, which characterized our ancestors. And the *Old Dominion* will soon put on a beautiful garment of *green*, "and all her paths drop *fatness*." All men, of every rank and nation, are deeply interested in the prosperity of agriculture.

The importance of established rules, of systematic operations, especially to the slave holder, is clear and indisputable. Slaves have generally been trained by agents, who have commonly been required to aim at quantity rather than quality in the common work of the farm; consequently, the slaves have acquired bad habits. Having been taught, by bitter experience in many cases, that quantity was the criterion of the days work, and caring nothing for the benefit of the crop, they have become expert in finding the easiest way—or in other words, to slight all kinds of work. This is true, with regard to the great majority. Having fallen into bad habits, confirmed by time, there is a strong necessity for a thorough and radical change in the plan of operation, or they will be forever falling back into their old ways; of making smooth the outside, regardless of the internal; which is the most important consideration. All intelligent, all thinking men, subscribe to the *force of education*—that it is strong and powerful—it has its influence on the slave as well as the freeman; "just as the twig is bent the tree's inclined." Hence, the necessity of having them well taught—of established rules—of systematic operation. Wherever it is practicable, the measuring rod should be applied; when impracticable, the work should be weighed or numbered. We have known the execution considerably improved, and from 25 to 33 per cent. added to the day's work, merely by counting the bundles of tobacco stripped and tied up, at the close of the day's work. When it is known by the hands that the quality of the work is to be rigidly inspected, as well as the quantity, they will take more pains in the execution; and the quantity will be increased, as well as the execution improved.

The necessity is urgent on Virginians, to attend to this subject in all its various ramifications. It requires intelligence and energy to resuscitate their impoverished fields, and bring them back to that state, in which they can behold them with pleasure, and in which we may anticipate a plentiful and prosperous futurity.

Let us then give to this important subject, the attention it so imperiously demands—let us give to the winds the false theory that slavery is incompatible with improvement—let us attend well to the application and execution of labor—let us obtain practical knowledge by forming agricultural societies—let us adopt systematic operation in every department—let us resolve that all our flat land shall be thoroughly drained—all our uplands receive as many trenches or conductors, as will be fully sufficient to conduct all the superfluous water in excessive rains—to sow all our arable land in grass—confine the hoof and the tooth to standing pastures—pay strict attention, and use strict economy in all the sources of manure. Let us attend to these particulars, and we shall soon see improvement in our fields, and plenty in our barns.

The anticipation of a long journey presents formidable barriers to a person unaccustomed to travelling; as long as the journey is in prospect, almost insurmountable difficulties arise. Imagination makes mountains of mole hills—there are lions in the way—the expense of the trip—the length of the way—the toil and fatigue of travelling—and many imaginary dangers standing thick around—discourage and conspire to make the journey formidable. We have only to "screw our courage to the sticking place;" to start, and all the difficulties vanish. The journey though long, is easily and pleasantly performed. Similar to this, is the commencement and the prosecution of a scheme of improvement. Opinions of long standing, prejudices strong and inveterate, established habits, expensive bills, trouble and vexation, stare us in the face, at the threshold of improvement. Commence, the difficulties are removed—the lions are chained. Excited and interested, more attention is bestowed; profit and improvement go hand in hand.

CHARLOTTE COUNTY.

For the Farmers' Register.

LIST OF PREMIUMS OFFERED BY THE BUCKINGHAM AGRICULTURAL SOCIETY.

1. For the best thorough bred stallion over two and under four years old—one year's subscription to the New York Sporting Magazine.
2. For the best thorough bred brood mare—one year's subscription to the American Turf Register and Sporting Magazine.
3. For the best thorough bred colt under two years old—the same as No. 2.
4. For the best thorough bred filly under two years old—the 1st vol. of Edgar's stud book.
5. For the best brood mare other than thorough bred—the same as No. 2.
6. For the best colt or filly other than thorough bred under two years old—the same as No. 2.
7. For the best jack over three years old—one year's subscription to the Farmers' Register.
8. For the best mule raised in the county, under five years old—Farmer & Mechanic, and Ohio Farmer.
9. For the best bull over two years old—the same as No. 7, and Genesee Farmer.

10. For the best bull under two years old—one year's subscription to the Southern Agriculturist.
11. For the best cow over three years old—one year's subscription to the New York Farmer and the Northern Farmer.
12. For the best heifer under three years old—one year's subscription to the Southern Planter and the Ohio Farmer.
13. For the best fatted ox or cow—buck carvers and steel—cost, not over $6.
14. For the second best—the same—cost, not to exceed $4.
15. For the best yoke of work oxen—the same as No. 7.
16. For the best ram—one year's subscription to the New York Farmer.
17. For the pen of best ewes, not less than six—one year's subscription to the Genesee Farmer and Farmers' Reporter.
18. For the second best—one year's subscription to the Genesee Farmer.
19. For the best boar—one year's subscription to the Maine Farmer and Northern Farmer.
20. For the best sow—one year's subscription to the Maine Farmer and Farmers' Reporter.
21. For the heaviest hog (live weight,) under one year old—ivory carvers and steel—cost, not over $4.
22. For the best suit of clothes, that is, coat, pantaloons and vest, made at home of wool and cotton, (the exhibitor wearing the same on the day of show and fair)—a pair of silver sugar tongs—cost, not over $3.
23. For the best piece of negro winter clothing not less than ten yards—a pair of silver sugar tongs—cost, not over $2 50.
24. For the best piece of carpeting not less than ten yards—a Britannia coffee pot—cost, not over $5.
25. For the best pair of stockings of wool, cotton, thread or silk—a silver thimble—cost, not over $1.
26. For the best specimen of domestic fabric (other than what is above named) made of wool, cotton, flax, hemp, silk, grass, any or all combined—a cream ladle—cost, not over $3.
27. For the greatest product in corn, not less than five adjacent acres—a two-horse plough.
28. For the greatest product in wheat, not less than ten adjacent acres—a three-horse plough.
29. For the greatest product (that is, the most money,) in tobacco, not less than five adjacent acres—a two-horse plough.
30. For the best farm, not less than 100 acres—a silver cup—cost, not over $12.
31. For the second best—the same—cost, not over $10.
32. For the third best—the same—cost, not over $8.

HOW TO CONSTRUCT AN "EDITORIAL COMMUNICATION."

To the Editor of the Farmers' Register.

It will be admitted, Mr. Editor, that the interest taken by readers in your journal, and also its general reputation, will depend in a very great degree upon what proportion of each number consists of original communications. It is very true, (as I have seen stated lately in another periodical,) that "a good article is none the worse because it has appeared before, and in some other work." But notwithstanding, readers do not like to be confined to second-hand articles, though they may be "as good as new." They think, and very reasonably too, that if the journals which furnish these articles at first, are equally cheap and accessible, it would be as well to have the articles in *them*, when both *new* and *good*.

Under this feeling, (whether right or wrong,) when I receive a new number of the Farmers' Register, I am sure first to look over your Table of Contents; and most cheerfully do I accord in the general opinion that your monthly bill of fare is always good, and presents a large and increasing proportion of original communications. But though your readers are satisfied in this respect, (and certainly I am for one,) still permit me to say, that you do not make the most of your opportunities; and if you will profit by the example which I shall place before you, your list of "original communications" may easily be made much longer than it is, and they can even completely "elbow out" all the selected articles, without losing a particle of their value. I will offer you a single fact as a striking illustration of this plan, and leave you to make the application. *Verbum sat, &c.*

Not long ago I first met with a copy of the agricultural journal called the * * * * * *. In glancing over the list of "original communications" in the Table of Contents, my attention was attracted by the title of "* * * * * * *. By the EDITOR." Turning to the page referred to, I found the same *imposing* title over a piece beginning with a paragraph by the editor, but which was merely introductory to the long communication which appeared first in No. * of the *Farmers' Register*, and which was here copied entire, except the initial letters which formed the original signature. Now it is true, that if one reads *carefully* the introductory lines, he will there find that the very long tail-piece to the small body, was copied from your publication. But the slight observer, as well as any other journals that might think fit to republish from this copy, would give credit for the whole, as it was there marked, to the editor of the * * * * * *, and not to the Farmers' Register.

Now I pray you, Mr. Editor, to observe the great advantage of this manner of constructing "original communications—by the editor." By the favor of the writer of this piece, you first enjoyed all the benefit of publishing his original communication; and next, your brother editor, by favor of his own ingenuity, enjoyed not only an equal, but a greater advantage—for it is not only claimed (in effect) as original, but as from his own pen.

If you had chosen to profit by this plan of writing editorials, all the various selected articles to which you have prefixed a few lines of your own remarks, would have figured as "original communications—by the editor"—and you may thus, with the utmost ease, appropriate to yourself every other piece that may hereafter be worth your selecting.

SOUTH.

Feb. 15th, 1834.

P. S. I have since seen proof of the practical value of the plan above described. Mr. N— 's directions to * * * * * * * * * * in

No. *, Farmers' Register, have been, by virtue of only two lines of introduction, appropriated by the editor of the aforesaid * * * * * *, as I learn by seeing the passage quoted from that publication (instead of yours,) by both our Southern Agriculturist, and Southern Planter. This sufficiently proves that the editors of both those journals were deceived by the form thus given to the article.

From an English Paper.

THE DEEPEST MINE IN GREAT BRITAIN.

The shaft at present sinking at Monkwearmouth Colliery, near Sunderland, has attained a considerably greater depth than any mine in Great Britain, (or estimating its depth from the level of the sea, than any mine in the world.) Pearce's shaft at the Consolidated Mines in Cornwall was, till lately, the deepest in the island, being about 1,470 feet in perpendicular depth, of which 1,150 feet are below the surface of the sea. The bottom of Wolf's shaft (also at the Consolidated Mines) is 1,230 feet below the sea; but its total depth is less than that of Pearce's shaft. The bottom of the Monkwearmouth shaft is already upwards of 1,500 feet below high water mark, and 1,600 feet below the surface of the ground. It was commenced in May, 1826. The upper part of the shaft passes through the lower magnesian limestone strata, which overlap the south-eastern district of the Great Newcastle Coal-field, and which, including a stratum of "freestone sand" at the bottom of the limestone, extended, at Montwearmouth, to the thickness of 330 feet, and discharged towards the bottom of the strata the prodigious quantity of 3,000 gallons per minute—for the raising of which into an off-take drift, a double-acting steam-engine, working with a power of from 180 to 200 horses, was found necessary. The first unequivocal stratum of the coal formation, viz., a bed of coals one and a half inches thick, was not reached till August, 1831, (being about 344 feet below the surface,) after which the tremendous influx of water which had so long impeded the sinking operations was "stopped back" by a cylindrical "metal tubbing" or casing, fitted (in a series of small portions) to the shaft, and extending from below the above bed of coal to within 26 yards of the surface. The sinking now proceeded with spirit—still, no valuable bed of coal was reached, although the shaft had passed considerably above 600 feet into the coal measures, and much deeper than had hitherto been found requisite for reaching some of the known seams. It became evident that the miners were in unknown ground. A new "feeder of water" was encountered at the great depth of 1,000 feet, requiring fresh pumps and a fresh outlay of money. The prospects of the owners became unpromising in the eyes of most men, and were denounced as hopeless by many of the coal-viewers! Coal-viewing, however, had as yet been limited to some 200 or 220 fathoms; and the views of the Messrs. Pemberton (the enterprising owners of this colliery) were not to be bounded by such ordinary depths; they considered rightly that the thickness of the coal formation might be vastly greater where protected by the super-incumbent limestone, than where exposed to those denudations which in the neighborhood of the "rise" collieries had probably swept away the strata through which their own shaft had hitherto been sunk; that they were therefore justified in anticipating the larger and known seams at greater depths; and that, in case these larger seams had been split into smaller strata, the same causes which in other places had produced their subdivision might, at Monkwearmouth, have effected their junction. They continued therefore their sinking, and in October last reached a seam of considerable value and thickness, at the depth of 1,578 feet below the surface, and presuming that this newly discovered seam was identified with the Bensham seam of the Tyne (or Maudlin seam of the Wear,) they are rapidly deepening their shafts, in anticipation of reaching the Hutton or most valuable seam, at no distant period, but which (if their anticipations are well founded) will be found at a depth approaching 300 fathoms from the surface! ! In the meantime, however, workings have very recently commenced in the supposed Bensham seam. A party of scientific gentlemen descended into these workings on Saturday last, and aided by every facility and assistance which could be afforded to them by Messrs. Pemberton, made several barometric and thermometric observations, the detail of which will be *deeply* interesting to many of our readers. A barometer at the top of the shaft (87 feet above high water mark) stood at 30,518, its attached thermometer (Fahrenheit) being 53. On being carried down to the new workings (1,584 feet below the top) it stood at 32,280, and *in all probability higher than ever before seen by human eye!* the attached thermometer being 58. Four workings or drifts had been commenced in the coal, the longest of them being that "to the dip," twenty-two yards in length, and nearly two in breadth—to the end of which the current of fresh air for ventilating the mine was diverted—(and from which the pitmen employed in the excavation had just departed) was selected for the following thermometric observations. (Temperature of the current of air near the entrance of the drift 62 (Fahrenheit;) near the end of the drift, 63; close to the face or extremity of the drift, and beyond the current of air, 68.) A piece of coal was hewn from the face; and two thermometers placed in the spot just before occupied by the coal (their bulbs being instantly covered with coal dust) rose to 71. A small pool of water was standing at the end of the drift. Temperature of this water at eleven o'clock, 70; three hours later, 69½. A register thermometer was buried 18 inches deep below the floor, and about ten yards from the entrance of the drift; forty minutes afterwards its maximum temperature was 67. Another register thermometer was similarly buried near the end of the drift, and after a similar period indicated a maximum temperature of 70. It was then placed in a deeper hole and covered with small coal:—some water oozed out of the side of this hole to the depth of six or eight inches above the thermometer, which, upon being examined after a sufficient interval of time, indicated a temperature of 71½. A stream of gas bubbles (igniting with the flame of a candle) issued through the water collected in this hole; the bulbs of two very sensible thermometers were immersed under water in this stream of gas, and indicated a temperature constantly varying between 71.5 and 72.6. A thermometer was lowered to the bottom of a hole drilled to the depth

of 2½ feet into the floor of another of the workings, and the atmospheric air excluded from it by a tight stopping of clay; this thermometer being raised after a lapse of 48 hours, stood at 71.2. The above observations will accord with the prevailing (and certainly well-grounded) opinion, that the temperature of the earth increases with the depth from the surface. It must not, however, be forgotten, that causes may be assigned for an increase of temperature in this and other coal mines, independently of the presumed subterranean heat. Those who are familiar with coal mines must have frequently witnessed the effects of the enormous pressure of the superincumbent strata, and a weight of twenty-five or thirty thousand tons which had lately reposed upon the coal hitherto occupying the drift above described, had suddenly been transferred to the coal situate on the sides of this drift. Hence those constant indications of tremendous pressure—the cracking of the sides and roof, and "heaving of the floor," and the crumbling of their materials, furnishing admission of air and water to innumerable fragments of shale, coal, and pyrites;—circumstances which are abundantly calculated to occasion an increase of temperature, both by mechanical compression and chemical decomposition, although wholly inadequate, as we conceive, to the generation of the temperature recorded on Saturday last: and the presence and lights of the pitmen were obviously inoperative in producing the effects remarked. Other experiments, however, in the prosecution of these inquiries, are, with the obliging permission of the owners, contemplated at Monkwearmouth Colliery, and amongst the minor advantages arising from their magnificent undertaking, will doubtless be the solution of any remaining doubts of the existence of considerable subterranean heat at *accessible* depths beneath the surface of the earth.

From the Penny Magazine.

ACCOUNT OF THE MERINO SHEEP, AND THE MESTA OF SPAIN.

Merino is the name of a Spanish breed or variety of sheep, which affords a wool esteemed to be finer than that which any other European breed produces. In this breed the males have horns, but the females are without them. They have generally white faces and legs. The body does not seem very perfect in shape; the legs are long, the bones small; and under the throat the skin is somewhat pendulous and loose. The skin of the animal is fine and clear. When they are somewhat fat, the weight, per quarter, of the ram is about seventeen pounds, and of the ewe about eleven pounds.

The sheep of Spain are divided into two principal sorts: the common sheep, which continue on the grounds of their owners, and are housed in winter; and the Merinos, which always remain in the open air, travelling before the summer to the cool mountains, and returning before the winter to the warm plains. The stationary sheep chiefly belong to the eastern provinces of Spain; while the Merinos belong to the central and western parts—the Castiles, Leon, and Estremadura. In summer they resort chiefly to the plains of the latter provinces, and in winter to the mountainous parts of Castile, which form the most elevated part of Spain, and abound in aromatic plants and fine pastures. Different accounts are given of the origin of this practice; but we have no distinct knowledge of the existence of travelling flocks in Spain until the time when the christians began to prevail against the Mohammedans in the thirteenth century, and came down from the mountains of the north into the provinces of the centre and the south. After that time, however, the system of migration became well and firmly established; and before the Moorish kingdom of Granada had been finally reduced in the fifteenth century, the system had been organized, under the authority of the government, in nearly its present form. This we shall now proceed to describe, taking Laborde, a statistical writer on Spain, as our principal guide in the description.

There is an institution peculiar to Spain called the *mesta*. It is a society of noblemen and other great proprietors, to whom the migratory sheep belong; who are empowered to make regulations concerning the migrations of the flocks; and who, in fact, are a great co-operative body of capitalists. Unfortunately they possess powers and privileges much at variance with the interests of the people. The term *mesta* is also applied to the great body of the migratory sheep in general; while the particular flocks are called *Merinos* and *transhumantes*.

These flocks, when assembled for migration, generally consist of about ten thousand sheep. Every flock is conducted by an officer called a *mayoral*, whose business it is to superintend the shepherds and direct the route: he is generally an active man, well acquainted with the kinds of pasturage, the nature of sheep, and the method of treatment. Under him there are commonly about fifty shepherds, each of whom is allowed to keep a few sheep or goats of his own in the flock, on the understanding, that although they and any young they may produce are his property, the wool and the hair belong to the proprietor of the flock. The number of persons thus employed in the care of the whole of the flocks that compose the *mesta* are about forty-five or fifty thousand. The dogs are also very numerous, fifty being the number commonly allowed to each flock.

It is at the latter end of April, or the beginning of May, that the flocks leave the plains for the mountains. When they have been driven to the place where they are to remain, the shepherds give them as much salt as they are willing to lick; and the quantity of this article allowed for their consumption during the five summer months is one ton for every thousand sheep. At the end of July the rams are permitted to associate with the ewes, but before and after that time they are kept separate. In September the backs and loins of the sheep are rubbed with red ochre dissolved in water; and towards the end of the same month they recommence their march to the plains of Leon, Estremadura, and Andalusia. The sheep are generally conducted to the same ground which they had grazed the preceding year, and where most of the lambs were born. Here folds are constructed for the sheep, and huts of branches for the shepherds; and there they remain during the winter. The birth of the lambs takes place shortly after the arrival of the flocks in winter quarters; and particular attention is paid to prepare them by good diet for the journey in April. In

March the shepherds have much to do with the lambs: they cut the tails, mark the nose with a hot iron, and saw off the points of the horns. When the time approaches for the flocks to depart for the mountains, they indicate their desire to migrate by their restlessness, and by their endeavors to escape. The shearing takes place in the month of May, during the summer journey. This business is introduced with much of preparation and ceremony, and the intervals of the labor are cheered by a great deal of jollity and merry-making. The shearing is performed under cover. The animals are previously put into a building consisting of two apartments, from four to eight hundred paces long and one hundred wide. As many of the sheep as are to be sheared the following day are taken in the evening into a narrow, long, low hut, called the *sweating-house*, where, being much crowded together, they perspire freely, which renders the wool softer and more easy to be cut. This is one of the practices the Spaniards appear to have derived from the Romans. One hundred and twenty-five men are usually employed for shearing a thousand ewes, and two hundred for a thousand wethers. Each sheep affords four kinds of wool, more or less fine according to the parts of the animal whence it is taken. The rams yield more wool than the ewes, but not of so fine a quality; three rams or five ewes afford twenty-five pounds. The wool is sorted and washed before being sent away. The sheep that have been sheared are carried to another place and marked; and those which, in the course of the individual inspection they undergo on this occasion, are found to have lost their teeth, are set apart to be killed for mutton.

The journey which the flocks make in their migration is regulated by particular laws and immemorial customs. The sheep pass unmolested over the pastures belonging to the villages and the commons which lie in their road, and have a right to feed on them. They are not, however, allowed to pass over cultivated lands, but the proprietors of such lands are obliged to leave for them a path of about eighty-four yards in breadth. When they traverse the commonable pastures, they seldom travel more than six miles a day; but when they walk in close order through the cultivated fields, they often proceed upwards of eighteen miles, and they have sometimes been known to go twenty-five or thirty miles in one day, in order to reach a convenient place for halting. The whole of their journey is usually an extent of from 360 to 420 miles, which they perform in thirty or thirty-five days. Popular opinion in Spain attributes the superiority of the wool in the Merino to these periodical migrations; but this appears to be disproved by the fact that the wool of the stationary sheep is sometimes equally good, and still more by the very great superiority of the wool of the German Merino, which does not migrate at all. The number of the migratory sheep in Spain is at present estimated at 10,000,000, and of the stationary at 8,000,000.

The existence of the system which we have been describing is considered to constitute a great bar to agricultural improvement in Spain. The mesta, of which we have already spoken, has a code of peculiar laws, administered by four judges, whose jurisdiction extends to all matters that are in any degree connected with the mesta, and who take particular care than none of its privileges shall be infringed. Among the evils which the system produces, it is complained that the forty or fifty thousand persons employed in attending the sheep are lost to the state, as to the purposes of agriculture and population, as they scarcely ever marry;—that a vast quantity of good land is converted into pasturage, and produces comparatively nothing;—that great damage is committed with impunity to the cultivated lands during the journeys of the flocks—and this is so much the more injurious as, at the time of the first journey, the corn is considerably advanced in its growth, and at the second, the vines are loaded with grapes;—that the commonable pastures also are so completely devastated by the migratory flocks, that the sheep of the resident population can hardly pick up a subsistence;—and that the flocks of the mesta are of no use in an agricultural point of view, for, as they are never folded upon arable land, they contribute nothing to its fertilization. Besides this, the directors and shepherds are dreaded in every place to which they come, for they exercise a most intolerable despotism—the consequence of the improper privilege which they possess of bringing whoever they may choose to insult before the tribunal of the mesta, whose decisions are almost invariably in favor of its servants. The existence of the mesta has therefore long been a subject of public complaint and remonstrance, and even the general states of the realm have been continually requesting the suppression of it. For a long series of years these appeals were made in vain, but about the middle of the last century the government felt itself obliged to pay some attention to the subject. A committee of inquiry was therefore appointed to take the matter into consideration, but the influence of the mesta prevailed in the committee and elsewhere; so that though the commission is still, we believe, understood to exist, it has not *yet* given its opinion on the subject of the mesta, or proposed any remedy for the evils it produces.

"The Merino, or Spanish breed of sheep, was introduced into this country [England] about the close of last century. George III. was a great patron of this breed, which was, for several years, a very great favorite. But it has been ascertained that, though the fleece does not much degenerate here, the carcass, which is naturally ill-formed, and affords comparatively little weight of meat, does not improve; and as the farmer, in the kind of sheep which he keeps, must look not only to the produce of the wool, but also to the butcher-market, he has found it his interest to return to the native breeds of his own country and abandon the Spanish sheep. They have, however, been of considerable service to the flocks of England, having been judiciously crossed with the South Down, Ryeland, &c." The Merino was introduced into most of the other countries of Europe, in the course of the last century, with very various success. It has also at later periods been carried out to New South Wales, Van Diemen's Land, the Cape of Good Hope, and the United States; and it seems now to have been sufficiently established that, wherever the animal has been attended to for the sake of its wool, it will afford good wool, but that the quality of the wool deteriorates when that of the mutton becomes an object.